STEEL

PRODUCTION • PROCESSING • DISTRIBUTION • USE

For forty-eight years—IRON TRADE REVIEW

EDITORIAL STAFF
E. L. SHANER, *Editor*
E. C. BARRINGER, *Managing Editor*
E. C. KREUTZBERG, *Engineering Editor*

ASSOCIATE EDITORS
A. J. HAIN — E. F. ROSS
G. H. MANLOVE — J. D. KNOX
A. H. ALLEN
New York — B. K. PRICE—L. E. BROWNE
Pittsburgh . . . E. A. FRANCE JR.
Chicago . . . . . W. G. GUDE
Washington . . . . . L. M. LAMM
London . . . . VINCENT DELPORT

Published by
PENTON PUBLISHING CO.
PENTON BUILDING
CLEVELAND, O.

JOHN A. PENTON, *Chairman of Board*
C. J. STARK . . . . . *President*
J. D. PEASE . . . *Vice President*
F. V. COLE . . . . . *Secretary*

BUSINESS STAFF
GEORGE O. HAYS, *Business Manager*
New York
J. F. AHRENS — E. W. KREUTZBERG
Pittsburgh . . . . S. H. JASPER
Chicago . . . . . L. C. PELOTT
Cleveland
JOHN HENRY — R. C. JAENKE
R. T. MASON, *Circulation Manager*

Contents . . April 15, 1935

Volume 96 ◆ Number 15

AS THE EDITOR VIEWS THE NEWS 21

Steel Report Shows Wages Secondary to Volume 22
Steel Breaks Even at 41.7 Per Cent Operations 23
Light Flat Steel Is Increasing Its Lead 24
Terms Paint an Asset in Steel Plants 24

NRA	24	Transportation	93
Production	26	Meetings	94
Merger	31	Financial	94
Labor	31	Users', Makers' Activities	95

Mechanization Makes More Jobs Than It Destroys 25
Mirrors of Motordom 27
Windows of Washington 29
Obituaries 31
Industrial Men in the Day's News 32

EDITORIAL—New Deal Aiding or Blocking Recovery? 35

THE BUSINESS TREND 36

ENGINEERING DEVELOPMENTS:

Furnaces at Packard	38	Stapling Machines	48
Changes in Screw Machines	40	Rolls Faced with Rubber	49
Making Small Springs	42	Reclaiming Pickling Liquor	57
Header Die Life Increased	43	Progress in Steelmaking	59
Methods and Materials	44	Melting Special Alloys	60
Roller-Gate Dam	45	Open-Hearth Insulation	62
Structurals in Truck Body	46	New Equipment	67
Actions and Reactions	47	Trade Publications	72

MARKET REPORTS AND PRICES 73-95

CONSTRUCTION AND ENTERPRISE 96

ADVERTISERS' INDEX 104

BRANCH OFFICES:

New York . . . . . 220 Broadway
Chicago . . . . Peoples Gas Building
Pittsburgh . . . . . Oliver Building
San Francisco . . . . 2413 Milvia St.
Berkeley, Calif., Tel. Berkeley 7354W
Washington . . . National Press Building
Cincinnati . . . 418-420 Sinton Hotel
London . . . . . Caxton House
Westminster, S. W. 1
Berlin . . Berlin, N. W. 40, Roonstrasse 10

Member Audit Bureau of Circulations; Associated Business Papers Inc., and National Publishers Association.

Published every Monday. Subscription in the United States, Cuba and Mexico, one year $4, two years $6; in Canada, one year $6.60, two years $11.20; in Great Britain and European countries, one year £2.

Entered as second class matter at postoffice at Cleveland under the Act of March 3, 1879.

Copyright 1935 by Penton Publishing Co.

PHILO BRAND

QUALITY · SERVICE · DEPENDABILITY

NON-METALLIC INCLUSIONS

Clean Steel

RELATIVELY FREE FROM NON-METALLICS CAN BE OBTAINED BY THE PROPER USE OF FERRO ALLOYS AND GOOD STEEL PRACTICE

FERRO-ALLOYS

Ohio Ferro-Alloys Corporation
Canton, Ohio

As the Editor Views the News

FOLLOWING the misstatements uttered by brain trusters concerning the relation of mechanization in industry to employment, the recent address by the chief of the machinery division of the department of commerce is as welcome to the maligned durable goods industries as cool, fresh air is to a dust storm victim in Kansas. Mr. Harrison declares (p. 25) that modern machinery has given more jobs than it has taken, and backs this assertion with convincing statistics. If the high command in Washington could be made to recognize the grave error it has committed (p. 35) in restricting, instead of stimulating, the equipment industries, recovery would proceed more rapidly.

• • •

A Yardstick for Profits!

In recent years, several commentators, including the editors of this publication, have speculated upon the percentage of operations which will enable the steel industry to break even. The guesses have ranged between 40 and 45 per cent. Now comes Colonel Ayres with a mathematical analysis (p. 23) of the relation between operating rates and profits. His study shows that the profit area is entered when the steelmaking rate rises to 41.7 per cent. For every per cent above or below that figure, the profit or loss is $8,000,000. In a period when yardsticks seem to be regarded with great favor in high places, this one merits attention.

• • •

Plateaus of Stability

The outlook for the second quarter is brighter than it was a few weeks ago. Latest reports from Detroit (p. 27) show that the urge for automobile replacements is breaking through political obstacles. Manifestations of this tendency throughout the country have bolstered sentiment in the motor car industry to the point where manufacturers are talking of a "big second quarter, almost as good as the first." This connotes a wide diffusion of improved conditions and tends to confirm our statements in recent issues to the effect that the present business structure rests upon a stronger foundation than those which supported the spurt in the second quarter of 1933 and the upturn in the first four months of 1934. A hint of the substantial character of the present foundation can be gained by comparing (p. 36) the "plateaus of stability" in industrial activity.

• • •

Lilliputs from Shop of Giants

The layman unconsciously associates steel with bigness. The industry is of mammoth proportions. Its leading companies are great corporations; its plants are tremendous in size; its production is measured in millions of tons. Yet the workshop of this industrial giant turns out products so Lilliputian in weight and dimensions (p. 42) that 167,000,000 of them are required to make a ton. These are tiny, open-wound, helical springs. The market value of a ton of such springs is about $200,000—so exacting is the mechanical skill required in forming them. And these diminutive coils represent but one of 160,000 recorded uses of wire! What other industry can match steel in range of size, scope of refinement and diversity of its products?

• • •

Finding Profit in New Ideas

Management executives who seek information of profit-making ideas will do well to watch the announcements of technological developments. One steelmaker reports important savings in fuel and reduced time of heats through the insulation (p. 62) of open-hearth furnaces. . . . Inasmuch as one-twelfth of America's production of sulphuric acid in 1934 was used in pickling solutions, the problem of reclaiming the acid from spent pickling liquor (p. 57) assumes importance for many companies. . . . A machine tool builder has killed several birds with one stone by designing an automatic screw machine (p. 40) in which the driveshaft of the motor also serves as the driveshaft of the machine.

• • •

The downward trend of the rate of steelworks operations (p. 26) was reversed last week.

E. L. Shaner

Steel Corp. Report Shows Wages Secondary to Volume

WITH an output of rolled and finished steel for sale only 8 per cent higher in 1934 than in 1933, as shown by its recent pamphlet report, the United States Steel Corp.'s total expenditure for wages and salaries was up 29 per cent.

This was the first calendar year in which production and distribution costs reflected the wage advance made in accordance with the steel code in August, 1933, and the further voluntary increase in 1934.

In 1933, the Steel corporation made 5,536,322 net tons of finished steel for sale. Its wages and salaries amounted to $163,149,503, and, therefore, its indicated wage-salary unit cost was $29.46 per ton.

In 1934 the output of finished steel was 6,004,585 tons; wages and salaries, $210,494,533, and the unit cost, $35.05.

Presumably, the Steel corporation could have made and marketed all its finished steel last year at the same unit cost as in 1933. If it had done so, its outlay for wages and salaries would have been $176,944,530, instead of $210,494,533. The difference — $33,500,000 — can be attributed wholly to the advances, a contribution to national recovery.

$100,000,000 for Industry

Proportionately, the additional wage and salary expenditures for the steel industry as a whole last year was no less than $75,000,000, and probably closer to $100,000,000. The Steel corporation's production of finished steel for sale was little more than one-third that for the industry, the official figures for the same classifications in each case not yet being available.

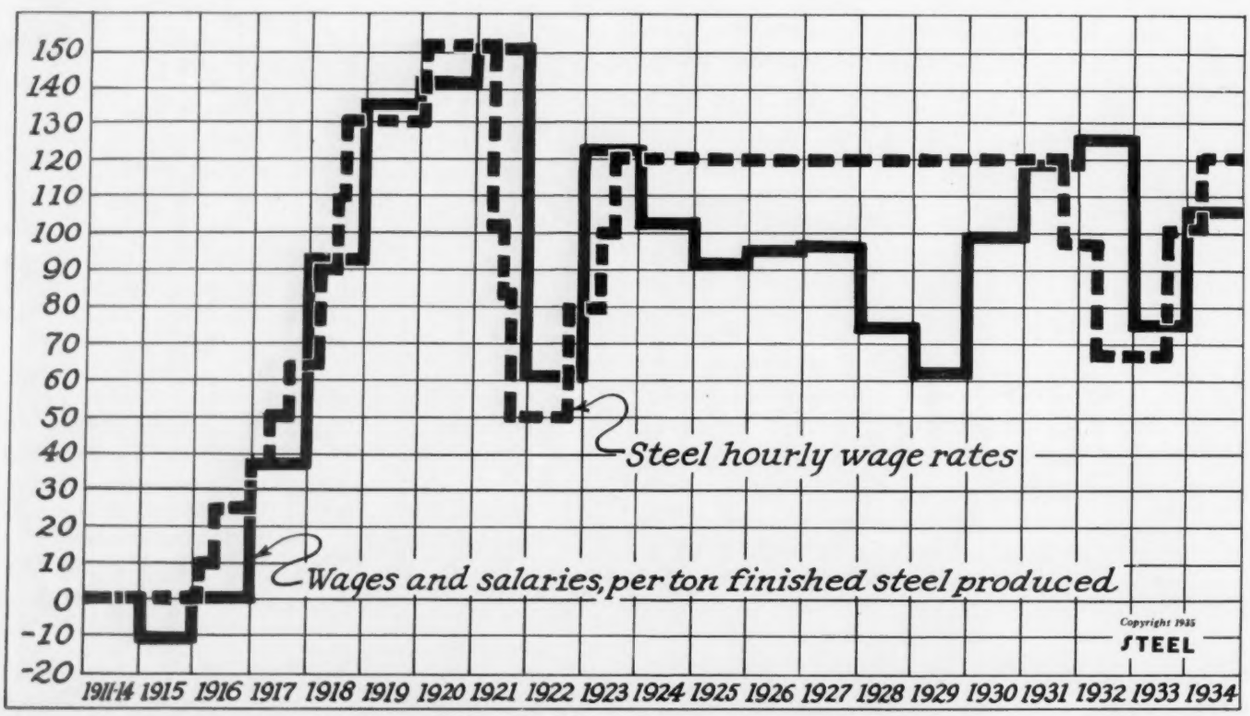
Partially compensating manufacturers for their higher costs in 1934 was the higher level of prices. STEEL's finished steel price index averaged $53.42 for the year, compared with $47.09 for 1933, a rise of 13 per cent. In 1929 the index was $57.66, whereas the unit wage-salary cost was only $27.45, compared with $35.05 in 1934.

Evidently, the rate of production is far more important to the steel industry than the wage rate. From the way the industry has been developed mechanically, high output invariably results in low unit cost. It is this that has led steel managers to say repeatedly they would prefer to pay high wages than low ones, because low wages generally are associated with low production. It has led many times to suggestions for wage rates based on output or on prices.

The effect production has on unit costs is shown by the Steel corporation's annual reports over a period of years—representing a cross section of all activities in the iron and steel industry.

For example, through 1924 and on to the fall of 1931, wage rates in the industry continued upon an even level. Yet during this eight-year period the wage-salary unit cost fluctuated as much as $10.29 a ton, according to production.

Further comparisons show when production drops wages and salaries carry on, raising unit costs. Eventually, an adjustment is made in wages and salaries. On the upswing, production rises first, and there is a period in which the producer gains



STEEL WAGE RATES COMPARED WITH LABOR COSTS: In both instances, the average for the years 1911-14, inclusive, represents the base from which the trend lines are charted. The wage-rate line represents the actual hourly wage rates. The other line represents average amount expended in wages and salaries, per ton of finished steel produced. Besides being influenced by wage rates, this unit cost varies according to output of finished steel. In the depression of 1921 the unit cost advanced, due to low production, although wage rates were reduced three times. In 1934 the unit cost was raised by the arbitrary advance in wages and salaries, as well as by restricted production. Figures at the left in the chart represent percentages above and below the 1911-14 base

through the reduced labor cost, which tends to compensate him for his previous loss.

This was the experience in the past, when there was the normal play of wages, prices and demand. The year 1934, however, was distinguished by an artificial adjustment. The effect of arbitrary wage and salary increases accumulated much faster than did the beneficial results from the slight rise in production.

The result was that the Corporation's wage-salary unit cost advanced from $29.46 to $35, or 17 per cent. It is much easier—if the industry has the money—to stimulate wages and salaries than it is to supply a larger demand for its products. Carried out to its logical conclusion, however, eventually the labor charge would have to fall in line.

U. S. STEEL CORPORATION'S UNIT LABOR COSTS

Year	Rolled and finished steel for sale, net tons	Total payrolls	Indicated per ton wage-salary cost
1910.....	10,733,995	$174,955,139	$16.29
1911.....	9,476,248	161,419,031	17.03
1912.....	12,506,619	189,351,602	15.14
1913.....	12,374,838	207,206,176	16.74
1914.....	9,014,512	162,379,907	18.01
1915.....	11,762,639	176,800,864	15.03
1916. ...	15,460,792	263,385,502	17.03
1917.....	14,942,911	347,370,400	23.24
1918.....	13,849,493	452,663,524	32.68
1919.....	11,997,935	479,548,040	39.96
1920.....	14,228,502	581,556,925	40.87
1921.....	7,860,334	332,887,505	42.35
1922.....	11,785,331	322,678,130	27.37
1923.....	14,721,469	469,502,634	31.89
1924.....	11,722,908	442,458,577	37.74
1925.....	13,271,010	456,740,355	34.41
1926.....	14,334,412	467,409,446	32.60
1927.....	12,979,282	430,727,095	33.18
1928.....	13,972,388	413,699,720	29.60
1929.....	15,302,669	420,072,351	27.45
1930.....	11,609,265	391,271,366	33.70
1931.....	7,196,017	266,871,413	37.08
1932.....	3,591,474	133,912,809	37.28
1933.....	5,536,322	163,149,503	29.46
1934.....	6,004,585	210,494,533	35.05

The depression of 1921 was short, but it made a sharp impression. In 1920 the Corporation's output was 14,228,000 tons, which was high, though not a record. It was in the flush of the postwar prosperity period, and early in that year it raised wages to their highest level. In 1921 its production was down 44 per cent, and its unit cost was $42.35, highest in the history, despite three successive wage reductions in that year.

Its production in 1929 was 15,302,600 tons, and its unit cost $27.45. In 1930, the first scratch of this depression, production dropped 24 per cent, and the unit cost rose 23 per cent.

In 1931 the Corporation made 7,196,017 tons. Then, in 1932 its output was down 50 per cent to 3,591,474 tons, lowest in more than 25 years. By this time, however, wages and salaries had been readjusted, so firmly that the unit cost rose less than 1 per cent to $37.28.

In the four pre-war years, 1911-1914, inclusive, its total output for the full period was 43,372,117 tons, and the average unit cost $16.73. In the four succeeding World war years the production was 56,015,835 tons, up 29 per cent; and its average unit cost, $21.99, up 31 per cent.

The unit cost, which appears to be the best means of making general comparisons, is obtained by dividing the total wage and salary outlay in a year by the tonnage output for that year. Practically all the Corporation's operations are centered on finished steel. The labor costs in its cement-making operations are comparatively small. Likewise, these expenditures include wages for new construction, which in 1934 amounted to only 3.8 per cent of the total. In prior years the Corporation did not separate these items.

Steel Breaks Even at 41.7%; Makes or Loses $8,000,000 Each Point Up or Down

WHEN the steel industry operates at 41.7 per cent it does so without profit or loss. For each per cent above this break-even point, for a year's time, it should show about $8,000,000 profit, and for each point below it, about $8,000,000 loss.

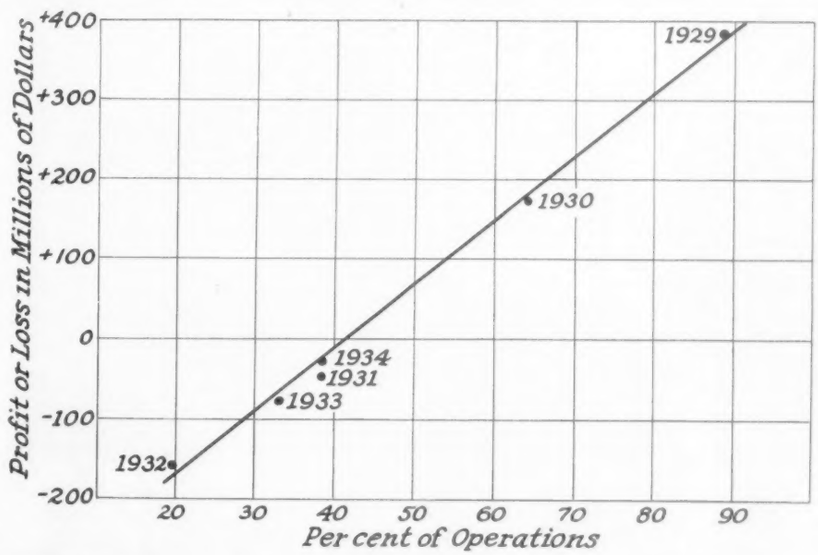
This theoretical neutral point—neither black nor red—has been calculated by the Cleveland Trust Co., Cleveland, from actual experience.

For example, in 1929 the industry's profits were $384,000,000, and the average rate of operations was 89 per cent. In 1930 its profits were $176,000,000, and operations 63.1 per cent. In 1931 its loss was $47,000,000, rate 38.1; in 1932, loss $154,000,000, rate 19.8; 1933, loss $72,000,000, rate 34; and 1934, loss approximately $25,000,000, and rate 38.5 per cent.

From maximum profits and operations to maximum loss and minimum operations a line has been charted, as shown in the accompanying diagram. The little dot in the diagram representing 1929 is located so that it is opposite $384,000,000, on the left hand scale, and directly above 89 on the scale at the bottom of the chart. The data for the other years were similarly located according to the profits or losses and operating rates for those years.

The fact that these little dots on the chart all lie upon an approximately straight line indicates that there is a close association between the rate of operations and the amount of profit or loss. The diagonal line in the chart represents the generalization of this relationship. It is calculated mathematically, and comes the closest to all the points.

This crosses the line representing neither profit nor loss at a point that



WHERE RED TURNS TO BLACK: Profits or losses for the steel industry are charted in relation to steelworks operating rate. See text above

corresponds to an operating rate of 41.7 per cent, thus indicating the break-even rate for the industry. The slope of the line supplies the further information as to how much profit or loss the industry should show for each point that it operates above or below 41.7 per cent.

Commenting on the results of the research in the Trust company's *Business Bulletin*, Col. Leonard P. Ayres, internationally-known economist, says:

"Last year was the fourth in succession in which the industry sustained net losses. It operated at rates above the break-even level for 19 weeks, and below them for 33. To make profits this year it needs to operate during the remaining months at just above 40 per cent."

Light Flat Steel Is Increasing Its Lead

CONSISTENT increase in the percentage of light steel products and a relative decline in heavier lines is shown in the accompanying chart, by the iron and steel division, bureau of foreign and domestic commerce, Washington.

Trends in the relative proportion of various classes of steel products during the past 30 years are distinctly marked. Rails have steadily lost ground. Structural shapes maintained their relative position through 1933 but dropped sharply in 1934.

Plates, sheets, strip and tin plate, a distinct class of light products, have grown uniformly until in 1932 they represented almost exactly half the steel production of that year. Automotive and container demands account for most of this increase. Since 1929 sheets and strip have consistently raised their relative position, despits the depression handicap.

Special alloy steels, in percentage of total steel production, have increased steadily and in 1932 accounted for more tonnage than did steel rails; in 1934 alloy steels exceeded the tonnage of rails or structural shapes.

Accumulated replacement needs may increase the relative position of rails and structurals but indications are clear that expanding demand for sheets, strip and alloys will be the main dependence of the industry.

Terms Paint Asset In Steel Plants

IT USED to be almost traditional that a steel plant had to be about the grimiest, dirtiest place in the world.

"But in recent years," says R. L. Harding, chief of the iron and steel division of the department of commerce, Washington, "conditions have been improved a great deal—even around the stacks, converters and furnaces—and paint is beginning to be used for protective purposes.

"In the modern mills," he points out, "the crane cabs and control rooms are painted and spruced up almost to the point of losing some of their drab ugliness. Much too often, however, the good work has stopped there. The department offices, the exteriors of buildings, the line fences around the plants and even the front offices—inside and out—have long since forgotten what a coat of paint feels like."

Mr. Harding believes that a well-painted plant indicates many things—good management, for example. It shows, he says, that the man in charge knows a worth-while investment should be kept in good shape if first class results are to be obtained, that the owner takes pride in his plant and, also unquestionably, in his products.

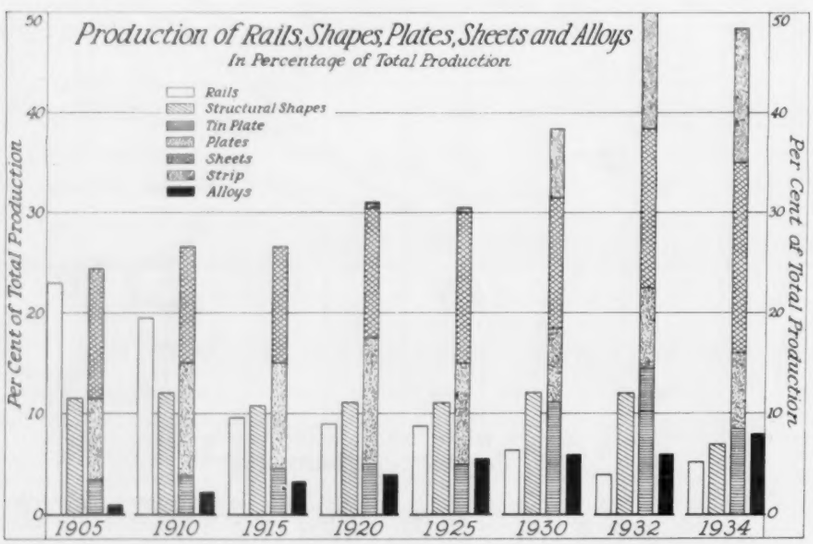
"The advertising value of well-finished surfaces," says Mr. Harding, "is a real asset. And the paint, if properly selected and applied, more than pays for itself in the protection it gives against rust and deterioration. Incidentally, such a coating provides much more than protection. A clean, well-painted plant has a real effect upon those who work in it; they take pride in the place and thus more pride in their work.

"In many of the shipping and finishing departments where grime, fumes, smoke and heat are not inherent," he continues, "there are strong arguments for interior painting. These are: More cheerful working conditions and better light.

"The question of light reflection from painted surfaces is of great importance. If the owner does not obtain the greatest possible light reflection from the wall surfaces, he must either furnish more artificial illumination or else expect the work to be done under inferior lighting conditions. Naturally, the latter means slower and poorer work, a higher percentage of imperfect products and often more accidents."

Mr. Harding points out that the steel mills connected with the Ford plants are clean and well managed and that much white paint is used within their confines.

"A rough survey of the steel mills and foundries in the chief centers of the industry," he declares, "indicates some 1,250,000 square yards of mill building exteriors that are crying for paint; 820,000 square yards of property fence in the same plight; nine out of ten of the plant offices are dingy inside and out, and even some of the main city executive offices are gloomy and depressing for want of a little color and reflected light."



NRA

AS MODIFIED by an administratixe order of March 25 suspending the fair trade practice section, the aluminum code last week was extended to June 16.

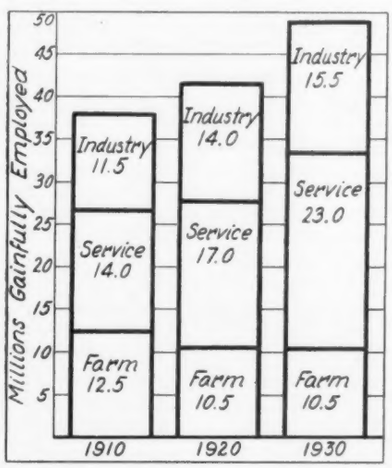
Other NRA developments: Metal window industry submitted budget of $30,175 for year ended Feb. 1, 1936; machine knife and allied products manufacturing industry proposed budget of $8785 for calendar year 1935; metal tank industry obtained approval of two amendments to its code, one defining the industry and the other clarifying schedule A; American Zinc institute served notice the approved code for the zinc industry contains many changes and that it cannot be bound by some of them.

Mechanization Makes More Jobs than It Destroys; Raises Living Standard

MODERN machinery has given more jobs than it has taken, is the assertion, backed by statistics, by R. E. W. Harrison, chief of the machinery division, bureau of foreign and domestic commerce, Washington, speaking recently before a gathering at the University of Tennessee.

In sustaining this conclusion Mr. Harrison adduced figures represented graphically in the accompanying chart and interpreted them as follows:

"There has been a consistent effort during the depression to discredit and restrict the progress of mechanization on the ground that it is a breeder of unemployment.



Although it is obvious that a given machine may tend to eliminate hand labor, often in a spectacular way, the machine year by year contributed to a larger volume of national employment until the crash of 1929, which was due to financial rather than technological factors. Increased mechanization now is not a barrier to re-employment but is one of the ways out of the depression.

"The American standard of living is measured by the use of machinery. This is illustrated statistically by an increase in the number of gainfully employed from 38 millions in 1910 to 49 millions in 1930, a net gain of 11 millions of workers. However, during the same period, farm workers actually decreased from 12½ millions in 1910 to 10½ millions in 1930, a loss of two millions and industrial workers increased from 11½ millions in 1910 to 15½ millions in 1930, a gain of four millions. Of still more importance, service workers increased from 14 millions in 1910 to 23 millions in 1930, a net gain of 9 millions, two-thirds of which occurred in the past decade."

The growth of service employment, he said, is due principally to the development of the machine, which has made it possible for so many people to enjoy in a 20-year period enough of life's goods to employ an additional army of 9,000,000 workers to distribute and service them.

The modern American conception of service to the individual, the corporation, the state and federal government, he stated, is probably more complete than exists in any other country and it is fair to say this large volume of service demanded and received by the American public is an accurate measure of the quality of the standard of living in the United States.

Production Trend Climbing

As to mechanization, Mr. Harrison pointed to the steadily rising trend line of industrial production employment and payrolls, interrupted only by the debacle of 1929, which he attributes to faulty financial procedure which dislocated all activities, in which broad economic causes were the actuating force and in which mechanization as a cause of unemployment has no participation.

The machinery industry, he pointed out, rates second in number of employes, fifth in the number of establishments engaged in the industry and fourth in value of its products. In 1929 it produced $7,000,000,000 worth of products, 10 per cent of the total turned out by all industries.

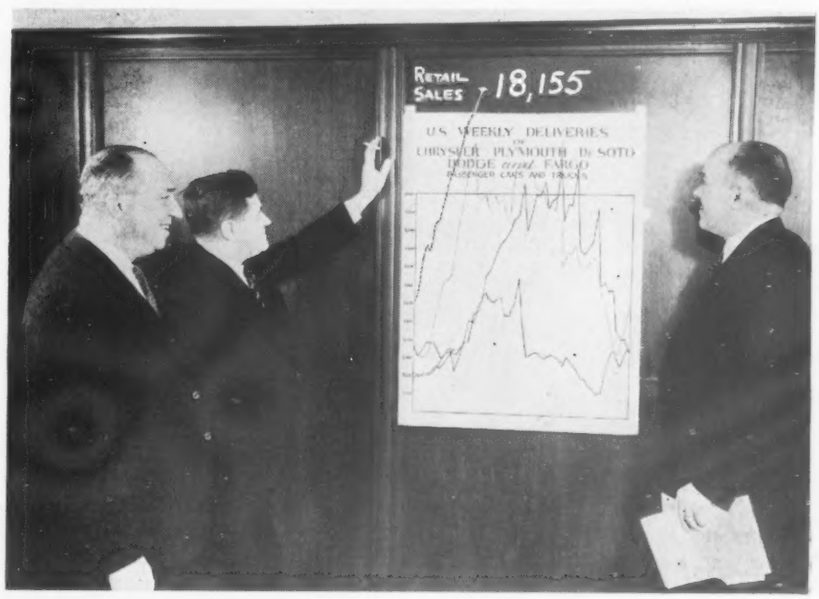
Auto Industry Justifies Stand

Comparing the highly mechanized automotive industry and the building industry he said:

"Our available statistics shows that the automobile industry is the outstanding member of the United States industrial community as far as recovery from depression is concerned. This industry is probably the most highly mechanized in the world. You all know what it has accomplished. During the period under review we have had a constantly increasing supply of better cars at lower prices. In the construction industry which, as far as records are available, is the least mechanized of all the basic industries, the latest available figures show that as against the average experience of all industries the building and construction industry is 65 per cent out of line.

"In other words, the cost of building construction is 65 per cent in

Sales Statistics Taken for an Airflow Ride



That smile of Walter P. Chrysler (left) comes easy these days. Each week now, the Chrysler Corp. is setting new all-time sales records, which are doubling 1929 volume. Here K. T. Keller, general manager of the Chrysler Corp., is pointing out to Mr. Chrysler and to B. E. Hutchinson, vice president, how retail sales in the week ended April 6, totaling 18,155, broke through the ceiling

excess of what it should be, should it be considered desirable for this industry to conform to the general industrial trend. Here, again, we have a conclusion which is inescapable. You know what the results have been. Probably the sorriest picture in our whole industrial setup is that provided by the dearth of employment in the construction and building industries at a time when our homes and factories are urgently in need of repair and renovation."

Production

STEELMAKING rose 1 point last week to 45 per cent, owing to a sharp gain of 5 points at Youngstown which offset losses at Cleveland, New England and Detroit. Although this upturn may not be significant as it usually takes two or three weeks to determine the trend, it is encouraging to note that it is the first indication of a rise since the second week of March. Details follow:

Central eastern seaboard—Held at 29½ per cent last week, with little variation expected this week.

Wheeling—Unchanged at 76 per cent last week, with the open-hearth rates of the three district producers individually unchanged from the week previous. Twenty-eight out of the 37 open-hearth furnaces were on active steelmaking schedule.

Youngstown—Increased 5 points last week to 55 per cent due to a slightly heavier schedule at the Youngstown Sheet & Tube Co.'s Campbell plant. The rate is expected to reach 56 per cent at this week's start.

Chicago—Rose to nearly 50½ per cent by the end of last week, after opening the week around 49. Mills are unable to schedule operations far ahead, due to the short-range nature of buying. Blast furnace operations are unchanged, 14 of 36 steelworks stacks being active.

Buffalo—Gained 2 points to 34 per cent, with 13 open hearths active. This rate is expected to hold this week.

Detroit—Off 6 points to 82 per cent last week, as one producer took off an open hearth and another still continued with two down.

Cleveland-Lorain—Down 5 points to 64 per cent, Corrigan, McKinney Steel Co. operating 11 open hearths, and Otis Steel Co. and National Tube Co., Lorain, 7 each. For part of this week Corrigan, McKinney will have all its four blast furnaces in operation as it lights one unit preparatory to blowing out another for repairs.

New England—Off 1 point to 52 per cent, with but slight change indicated for this week. One producer in the district continues at 75 per cent.

Birmingham — Thirteen open-hearth furnaces continue in operation as rail rolling requirements are steady, holding the rate to the level of 55½ per cent.

Pittsburgh—Unchanged at 34 per cent last week. Steel producers' open-hearth rates are now more in conformity with finishing mill schedules, as ingot banks are not being noticeably decreased. The steadiness to steel buying over the past two weeks has provided an encouraging guarantee to operations locally for the balance of April.

Twenty out of 60 steelworks blast furnaces continue in blast here.

Steelmaking Operations

Percentage of Open Hearth Ingot Capacity Engaged in 10 Leading Districts

	Week ended April 13	Change	Same week 1934	Same week 1933
Pittsburgh	34	None	39	18
Chicago	50½	+ 0½	50	20
Eastern Pa.	29½	None	38½	12½
Youngstown	55	+ 5	57	19
Wheeling	76	None	69	†
Cleveland	64	— 5	69	32
Buffalo	34	+ 2	50	19
Birmingham	55½	None	52	12½
New England	52	— 1	78	†
Detroit	82	— 6	82	†
	45	+ 1	51	20½

†Not reported in 1933.

U. S. STEEL CORP. SHIPMENTS

(Inter-company shipments not included)

(Tons)

	1935	1934	1933	1932
Jan.	534,055	331,777	285,138	426,271
Feb.	583,137	385,500	275,929	413,001
March	668,056	588,209	256,793	388,579
3 mo.	1,785,248	1,305,486	817,860	1,227,851
April		643,009	335,321	395,091
May		745,063	455,302	338,202
June		985,337	603,937	324,746
July		369,938	701,322	272,448
Aug.		378,023	668,155	291,688
Sept.		370,306	575,161	316,019
Oct.		343,962	572,897	310,007
Nov.		366,119	430,358	275,594
Dec.		418,630	600,639	227,576
Yrl. adj.			44,283	5,160
Total		5,925,873	5,805,235	3,974,062

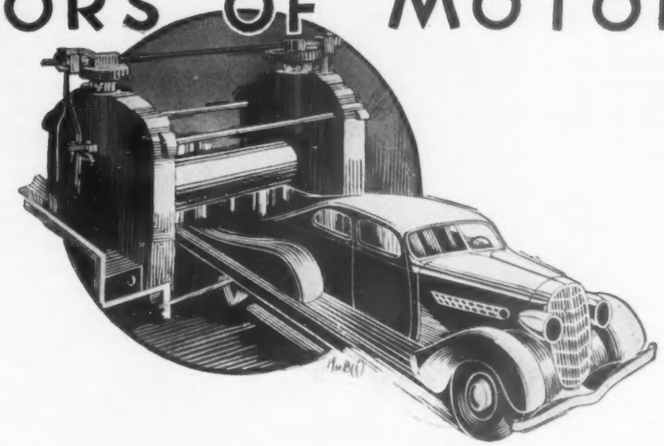
Welcome Chevrolet to Baltimore

HERE IS A SCENE in the hood polishing department of the new Baltimore Chevrolet assembly plant, showing how modern factory layout gives employes plenty of room and light for their work. The plant, with a capacity for assembling 80,000 cars a year, was opened formally April 9, with appropriate ceremonies and a banquet in the evening sponsored by the Baltimore association of commerce and attended by leading officials of General Motors and city and state executives. A feature of the plant is the use of overhead galleries for material storage, from which conveyors feed subassembly lines below. Speaking following the banquet, Alfred P. Sloan Jr., president of General Motors, said, that in these assembly plants in this country and abroad General Motors has "total investment of approximately $79,000,000, employs 36,500, with annual payroll in excess of $50,000,000"

CORP. SHIPMENTS UP AGAIN

Shipments of finished steel by the United States Steel Corp. in March showed a gain for the sixth consecutive month, rising 84,919 tons from 583,137 tons in February to 668,056 tons in March. Cumulative tonnage for three months in 1935 is 1,785,248 tons, compared with 1,305,486 tons in the same period of 1934 and 817,860 tons in first quarter of 1933.

MIRRORS OF MOTORDOM



DETROIT

THREE weeks ago automobile manufacturers cut off their releases for most materials so sharply it seemed they had used a cleaver. Even considering that a quarter was being turned, this letup in demand was so abrupt it gave suppliers and Detroit the jitters.

But in the meantime, assemblies have actually increased, considering the industry as a whole, and last week some substantial releases, including sheets, again made their appearance. So vendors and Detroit are again breathing easier, and are talking of a whopping big second quarter, almost as good as the first.

What happened three weeks ago was this. Early in the year, when automobile manufacturers were attempting to push out their new models as rapidly as possible, they overbought in order to protect themselves. And, naturally, the larger the assemblies the greater the float or bank of materials and parts necessary to insure uninterrupted production.

TAKING NO CHANCES

Nearing the turn into the second quarter, many automobile manufacturers found themselves with three to four weeks' floats. As Washington again began veering toward the left, there were some apprehensions concerning the effect upon retail sales. The two Pittsburgh basing point reports, for example, cast a shadow on steel prices. Hence caution became a byword.

But with April half gone, the retail sales situation continues strong, and in many northern localities the advent of real spring buying weather still is awaited. The country over, the urge for replacement is breaking through political obstacles. Except for used cars, dealers' stocks are not excessive, and April output is certain to top that of March.

This strong production situation, which is in turn the direct reflex of the brisk retail market, is necessitating further buying notwithstanding the desire to play the material game a little closer to the belt.

There is now no question in Detroit but that the second quarter will be much better than was expected 30 days ago, and there is an increasing feeling that this brisk situation will carry into July at least.

As viewed in Detroit, the country is definitely on the road to recovery. The industry likens recovery to a glacier which may be retarded occasionally by obstacles, but is impelled by such an irresistible force that these obstacles are shortly engulfed and the huge mass again moves on.

STILL LOOK FOR SPRING PEAK

Retail sales appear the more promising considering that this has been a cold, backward spring. Some executives whose thinking in the past has usually been right believe that neither the stock market nor industrial activity has yet attained its spring peak, and that wheat and rye will shortly break through their ceilings, as corn and oats already have. This has an important bearing on sales of automobiles in the Middle West. These executives, incidentally, look for $1.75 wheat by fall.

One of this group who has called most of the stock market turns since the inauguration of Roosevelt in March, 1933, and has made money, is sticking out his neck to this extent—that the present good automotive situation will carry into the third quarter of this year, to be followed by only moderate activity until the defeat of Roosevelt in November, 1936, which will precipitate business activity in 1937 and 1938 paling even 1929.

Speaking of the retail sales situation, there is one bad spot which is due for immediate correction. In almost every instance, dealers have taken in a used car for every new car sold. Ford dealers having led in sales, their stocks of used cars are the heaviest hanging over the market. The weather has been unseasonable for moving used cars, but Ford is preparing a special advertising campaign to be released shortly, when the time appears propitious.

CLAIM STOCKS NOT EXCESSIVE

This matter of stocks, both of new and used cars, is a sensitive one, and all makers disclaim being gorged. The figures tend to substantiate the industry. Ford, for example, produced 386,326 units in the first quarter, domestically, and reports retail sales of 293,318. This is an excess of production over sales of approximately 93,000 units. Spread over 7500 dealers this indicates an average stock of about 12 cars—not abnormal. Of course, there is an element of carryover and a lag between assembly and sales which cannot be accurately reckoned.

On new cars, April advertising schedules are heavier than seemed probable a month ago. Chevrolet is releasing the largest campaign. Ford, Pontiac and Plymouth are not far behind. Dodge opened up strongly last week. Olds is holding back a little because it is behind on deliveries. La Salle is spotting its advertising in districts where its dealers have been stocked.

FORD continues the great unpredictable element of the automobile industry.

In common wth other manufacturers it is engaged in reducing its float from 28 to 30 days at the turn of the quarter to approximately ten days as of June 1. At present, Ford floats are unbalanced despite the elaborate self-leveling system in vogue at the Rouge plant.

Incidentally, if Ford ever gets down to a 10-day float and any supplier fails to meet his schedule, Ford purchasing agents are likely to become pretty tough.

At this time, almost every square foot of available storage space within

the Rouge plant is jammed with steel. One rumor has the supply of sheets as large as 70,000 tons, but this is probably an exaggeration.

But while engaged in reducing its float, Ford is accumulating raw materials at a rapid rate. The stocks of bars and semifinished steel that have been piled up give the Rouge plant the aspect of postwar ship scrapping days, when enormous tonnages of ship parts and scrap were on the ground.

Over the past three weeks upward of 25,000 tons of scrap—mostly hydraulic compressed bundles — has been thrown down. This is not only the excess of Ford's scrap producton over the present requirements of its open hearths, but it also has come from Murray and Briggs.

When the new bloming mill is installed the open-hearth department, it is understood, will have to go down for at least 60 days. This makes the accumulation of semifinished steel and bars understandable. But when the open hearths go down the scrap they now consume will have to be marketed or thrown down, and at 6500 cars daily, Ford is probably originating close to 1500 tons of scrap a day.

SWAPPING IS PROBLEM

With one Ford blast furnace stack out for relining, the one stack that is in operation is being run on basic iron to supply the open hearths. The inventory of foundry iron being low, Ford has inquired for 10,000 tons of foundry. There was some talk last week that this was to be acquired on a reciprocal basis.

This reciprocal business is a trouble maker.

Recently, a northern Ohio interest was reported to have traded pig iron and bars, and possibly also some sheets, with one of the largest automotive interests, taking back scrap. This aroused competitors in all products involved and precipitated gossip on the point of iron and steel prices being fixed by that industry's code but scrap prices being unregulated.

So much pressure has been brought to bear upon this automobile manufacturer that last week it was said at least 50 per cent of the deal, in point of tonnage, was being called off.

It is also noteworthy that the volume of scrap generated by the automobile industry has not increased lately proportionate to the expansion in automobiles. This is a natural sequel to more efficient operations and the ability to order to closer tolerances as production problems on the new models are licked.

AS DIE work for the new Buick, due about Aug. 1, progresses, it appears probable that a new trend in styling will be disclosed.

Speaking in general terms, over the past two seasons the flare in the industry has been for a streamlined effect in which detail may broadly be said to have been subordinated to the objective.

Having put over basic streamlining, attention is now being centered on detail, and the new 1936 Buicks probably will point the way.

For one thing, the over-emphasis on fenders is not expected to be repeated in Buick. There is one General Motors line in which the fenders are so extreme in comparison with the body that, as one critic puts it, this line looks as unbalanced as a Boston bull pup would appear wth police dog ears.

WILL USE DIE-CAST GRILLE

Buick, of course, will have flat running boards, but the fenders will be conservative. The radiator grille, like Olds this year, will be die cast. This grille will be narrower, simulating LaSalle, but will retain the distinctive Buick touch.

Horns will be concealed; in fact, the 1936 car with exposed horns will be the great exception. The turret all-steel type of top will make its debut on Buick with the 1936 series. A divided windshield also is a certainty.

Hydraulic brakes are a probability, although Buick is supposed to have the best mechanical brakes ever put on General Motors cars.

At this date, no prices naturally have been set, but with the new La Salle edging further into the Buick price range by coming down into the $1200 class, the presumption is that Buick will be lower priced.

Detroit is getting quite a "kick" about the manner in which some Buick die work has circulated. In order to eliminate every possibility of a holdup due to concentration of die work in Detroit, a share of it was placed outside. Now, it develops, some of these outside die makers sublet parts of their contracts to die shops in Detroit. This puts most of the eggs back in one basket again.

ONE reason Olds has been engaged in a neck-and-neck contest with Pontiac this season is its inability to turn out more cars. When Olds goes beyond 800 to 1000 a day, it is straining its present facilities. Hence, a big expansion program at Lansing.

As announced last week, Oldsmobile has bought the former Durant plant in Lansing, occupying a 48-acre site, containing 900,000 to 1,000,000 square feet of floor space, and idle since 1931. Most of the machinery in the Durant plant, which cost about $5,000,000, has already been sold.

To this old Durant plant all of the Fisher Body operations at Lansing will be transferred, and daily capacity will be increased to 1500 bodies. Plans are not yet complete, but Fisher will undoubtedly require considerable new equipment in its enlarged quarters.

The present Fisher Body plant, immediately adjacent to the Olds plant, will be rehabilitated for the expansion of various departments of Olds, and capacity will be expanded to enable 1500 jobs daily to roll off the assembly lines. Olds employment will be increased about 4000 men.

FORD production last week pushed to a new high when it reached 39,055 on a 6-day week basis, against 38,500 the preceding week.

The total for General Motors was 39,500, compared with 38,425 the preceding week. This breaks down into Olds 4500, Pontiac 4150, Buick 1500, Cadillac-LaSalle 750, and Chevrolet 28,600.

Chrysler's total last week was 19,725, a practically stationary position, distributed about 10,350 units for Plymouth, 7000 for Dodge, 1100 for DeSoto and 1300 for Chrysler.

Plymouth, incidentally, has brought out a convertible coupe which involves the use of two frames, which means more steel. The regular X-type chassis frame is 6 inches deep. A sub-frame also X-type and 4 inches deep is bolted to the regular frame, thus putting passengers on top of a 10-inch steel girder, surrounded by the steel wall of the body.

Other production statistics for last week include: Auburn, 150; Graham, 650; Lincoln, 55; Nash, 1700; Studebaker, 1600; Pierce-Arrow, 35; Packard, 100 of the low-price series and 160 for the rest of the line; Mack truck, 40; White-Indiana, 125.

Automobile Production

Passenger Cars and Trucks—U. S. Only
By Department of Commerce

	1933	1934	1935
Jan.	128,825	156,907	292,765
Feb.	105,447	231,707	340,544
Mar.	115,272	331,263	410,000*
3 mo.	349,544	719,877	1,043,309
Apr.	176,432	354,745	.....
May	214,411	331,652	.....
June	249,727	308,065	.....
July	229,357	266,576	.....
Aug.	232,855	234,810	.....
Sept.	191,800	168,871	.....
Oct.	134,683	132,491	.....
Nov.	60,683	78,465	.....
Dec.	80,565	183,187	.....
Year	1,920,057	2,778,739	.....

*Estimated.

Estimated by *Cram's Reports*
Week ended:

April 6	107,895
April 13	109,337

WINDOWS OF WASHINGTON

WASHINGTON

NOW that the President has signed the five billion dollar work relief bill, there is no question but that within the next couple of years the iron and steel industry of the country will benefit to the extent of many millions.

To just what extent no one can fortell. However, the very nature of the program means that thousands of tons of all kinds of iron and steel will be necessary.

Again—now that the bill has become law—the hotel lobbies of this city are swarming with those who want to be on hand when the spigot is turned, and there was much gnashing of teeth when the President on his return from his fishing trip last week did not open up the barrel.

Statistical experts, of which the number is legion, have estimated that the government will have to spend at the rate of $155 per second, day and night, Sundays and holidays in order to disburse the appropriated money within the two-year period allowed by the bill.

At the time this is written, nothing but the broadest kind of breakdown is possible.

Staggering Pile of Millions

The bill provides for $800,000,000 for highways, roads, streets, and grade crossing eliminations. For rural rehabilitation and relief in stricken agricultural areas, the appropriation amounts to $500,000,000; for rural electrification, $100,000,000; housing, $450,000,000; projects for professional and clerical persons, $300,000,000; civilian conservation corps, $600,000,000; public projects of states or political subdivisions, $900,000,000; sanitation, preventation of soil erosion, reforestation, forestation, flood control, and miscellaneous projects, $350,000,000.

There is also a provision in the law "that not to exceed 20 per centum of the amount herein appropriated may be used by the President to increase any one or more of the foregoing limitations if he finds it necessary to do so in order to effectuate the purpose of this joint resolution."

There are some interesting facts available in connection with certain projects. For instance, of the $800,000,000 appropriated for roads, it has been estimated by government officials that $500,000,000 will be used for roads and $300,000,000 for grade separations. Of course, a large tonnage of reinforcing bars and structural steel will be used in both of these cases. Steel will also have to be used in large amounts in the special housing program.

States Plan Road Projects

As regards the road program, congress got around the pork barrel situation to some extent, at least, by providing that the projects are to be worked out by the various state highway commissions and these must be submitted to the United States bureau of public roads.

Details of this tremendous program are not available as this is written. At a press conference the President held upon his return from his fishing trip last week, he stated that every effort will be made to get the program under way at the earliest moment. He stated that while the money is available until July 1, 1937, that the administration will use every effort to see that it is spent by July 1, 1936.

Irvin F. Lehman, president, Blaw-Knox Co., Pittsburgh, is clearer than Washington officials on the prospectiv requirements for highway machinery. The volume of work both under way and prospective will require at least $125,000,000 worth of equipment, he maintains.

While it had been hoped that the peak of the spending period could be reached by Oct. 1, owing to the delay in congress with this bill it will probably be the middle of November before the spending peak is reached, the President stated.

The President also made it plain that, while some new organizations may have to be set up, he will make every effort to use the existing agencies of the government for carrying out this vast program. He said that he did not think that the people should overstress the mechanical setup for the spending of this large sum of money. It is going to take quite a long time, he stated, to get certain types of projects under way. He did not say just what he had in mind in this connection.

During the same conference the President stated definitely that in putting the millions of men to work, which he expects to do under the new setup, he is going to be careful that labor is not shunted from one place to another but have them assigned jobs within reasonable distance from their homes, to eliminate the building of camps or what not to house the laborers.

While none of this money is earmarked for the purchase of machine tools and other types of machinery, three of the government departments will make a desperate effort to get $18,000,000 for the purchase of tools.

Navy Wants More Machinery

Secretary of the Navy Swanson sent a letter to the senate asking for some of this money for the use of the navy for the purchases of machinery, but there is no special provision in the bill as it became law. On the other hand there is provisions for buildings, supplies and "other improvements" for the navy. This will be construed, if the navy has its way, into meaning machinery.

It is stated here by those in a po-

sition to know that the navy yard machine tool equipment has an average age of 33 years, while the tools of the air corps have been in use since the war. The idea is that so long as the government is urging industry to modernize it should do the same thing itself.

The army hopes to draw on this large fund for about $5,000,000 for machine tool purchases, the air corps for $3,000,000 and the navy for $10,000,000.

NRA ADVISORY BOARD PERSONNEL REVAMPED

As chief of NRA, Donald Richberg, is going about making his changes in the personnel of the organization quietly instead of with much ballyhoo as has been done in the past. Not even press releases are being issued now when these personnel changes are made, which is quite different from former days.

The place on the NRA industrial advisory board left vacant by W. P. Witherow, Pittsburgh steel manufacturer, when he became a member of the national industrial recovery board has been filled by Roger B. Shepard, who is now vice chairman of the industrial board. Mr. Shepard is a Yale graduate, was president of the firm of Finch, Van Slyck & McConbell, Chicago, and has been a resident director of the industrial board since Aug. 29, 1934.

Mr. Richberg has also appointed Walter White as a resident member of the same board. These two men, with Rudolph S. Rauch, complete the resident membership of this board.

Mr. White, a Princeton graduate, was associated with the Phelps-Dodge Corp. for a number of years and has also been connected with various aviation companies in the past. He became executive secretary of the industrial board on Aug. 1, 1934, and is now made a resident member of that board. These positions are particularly important to the industrial interests of the country because they are the "watch dogs" of the codes.

RICHBERG SPECIALIST IN NOISELESS "CRACKING DOWN"

They used to talk about "crack-down" Johnson. Well, they might say the same thing about Mr. Richberg—only he is arriving at the same ends with not quite so much noise.

Last week, the lumber control committee of the code authority was all set to definitely ditch the whole lumber code. Sentiment on the committee was overwhelmingly in favor of that. Mr. Richberg heard about it and immediately got his machinery working.

Members of the committee were hounded, with the result that the whole control committee was invited to a conference with the national industrial recovery board. They attended a four hour conference, at which time no one but Mr. Richberg said a word, according to inside information, and they came out signing a joint statement with NRA to the effect that they had reached a compromise. And how.

Needless to say, it would have been bad business for NRA at this particular stage of the game if the lumber industry had withdrawn its code and there is no question but what Mr. Richberg did his stuff.

FEW MAKE ALLOWABLE 15% PRICE CUT TO GOVERNMENT

An inconclusive report has been sent to the President by NRA as the result of a study made by its research and planning division of the effects of the executive order permitting the quotation of prices to governmental agencies of not more than 15 per cent below the bidder's filed prices. Even Mr. Richberg at a recent press conference admitted that the study is of little value. No definite conclusions were drawn by the report.

"Executive order No. 6767 (relating to the 15 per cent reduction) appears to have had no great effect upon tie bids in one direction or another," states the report.

"It appears that the discount permitted by the order has actually been used in relatively few of the industries covered in the study and that there is only an inference that it has affected tie bidding in certain cases.

"While in some industries there is a decrease in the number of tie bids after the issuance of the order, yet in others there has been an increase. Out of a total of 85 sets of contracts studied, all relating to purchases of the procurement division of the treasury and the bureau of supplies and accounts of the navy, there is little trend either toward increase or decrease."

SPECIAL STUDY ON CODE HALF VICTORY FOR FABRICATORS

Maj. Robert N. Campbell, the deputy NRA administrator who has had charge of the structural steel code, has just made a report at the request of the national industrial recovery board on the code, in which he recommends that the code be put under the construction code. This is what the structural steel industry has been fighting all along.

Major Campbell recommended also, it is understood that instead of being under the regular construction code authority that a special "impartial" committee be appointed to have charge of the code. The matter of the structural steel code is now under "must" on the agenda of the recovery board and it is expected that something definite will be done on it within the next few days. Clyde C. Conley, pesident, American Institute of Steel Construction, conferred Friday with Mr. Richberg and William P. Witherow, an industry representative on the national industrial recovery board.

STARTS CHISELING ON CODES

A precedent was established last week by the federal trade commission when it cited in a formal complaint the members of the code authority for the rubber industry because the commission claims that they exceeded their authority in certain actions. This is probably the beginning of the trade commission's activities with regard to NRA codes and code authorities.

Dealing with this particular incident, the commission in its complaint charges that members of the code authority entered into an alleged agreement, combination and conspiracy to fix prices, and they are further charged with maintaining a boycott by refusing to supply their products to any wholesaler or retailer who failed or refused to quote or to sell at prices as fixed under the alleged agreement, combination or conspiracy.

ADVISERS PREFER NIRA

Secretary of Commerce Roper's business and planning council as well as the NRA industrial advisory board have passed resolutions condemnng the Black 30-hour week bill, the Wagner labor disputes bill, and the Connery equal representation bill, and asking for the reenactment of NIRA. These resolutions, identical in substance, are especially interesting because on these boards are representatives of many different branches of industry.

"The NIRB has not been in effect long enough," the resolutions say, "to demonstrate whether or not it will be effective for its purposes. Its chief accomplishments have been in connection with child labor, maximum hours, minimum wages, and collective bargaining. We believe that further progress will best be brought about by its continuance for a further period, rather than the enactment of different and alternate legislation."

RECORD CONTRACT TO BERGER

The government has just awarded to the Berger Mfg. Co., Canton, O., subsidiary of the Republic Steel Corp., a contract for furnishing 2300 tons of metal files and filing record cases at $545,000 for the new Archives building being erected here by the government. This is said to be the largest contract of its kind ever awarded.

Died:

JOHN HILL WHITING, 84, chairman of the board, Whiting Corp., Harvey, Ill., pioneer foundryman and manufacturer of foundry equipment, in Chicago, April 6. He began his career as clerk in the foundry of the Michigan Car Co., Detroit, and ultimately became general superintendent, a position he held for 20 years. His ingenuity in perfection of improved methods and equipment in foundry work led to the formation of the Whiting Foundry Equipment Co. in 1894, later changed to Whiting Corp. The company builds a wide line of equipment including cupolas, ladles, tumbling mills, elevators, cranes, railroad shop specialties, chemical machinery, pulverized coal equipment, stokers and the like. He was a charter member of the American Foundrymen's association.

♦ ♦ ♦

C. D. Armstrong, 73, for 21 years president of the Armstrong Cork Co., Lancaster, Pa., in Pittsburgh, April 2.

♦ ♦ ♦

Edmund Dalgleish, 58, retired president of the Chase Machine Co., Cleveland, in that city, April 5.

♦ ♦ ♦

Christian E. Schafer, for 30 years plant superintendent of the D. Connelly Boiler Co., Cleveland, in that City, April 10.

♦ ♦ ♦

James Laughlin III, 52, member of the family which founded the Jones & Laughlin Steel Corp., Pittsburgh, in Zellwood, Fla., April 8.

♦ ♦ ♦

Irving W. Downing, 73, founder and president of the I. W. Downing Pump Co., Milwaukee, power plant specialties, in Milwaukee, April 7.

♦ ♦ ♦

Capt. Joseph H. Linnard, 75, retired naval architect who played an important part in the development of steel ships, in Philadelphia, March 31.

♦ ♦ ♦

George W. Crawford, 74, president of the Columbia Gas & Electric Corp., Pittsburgh, and a leader of the natural gas and oil industries, in Pittsburgh, April 6.

♦ ♦ ♦

William H. Dye, 69, retired general auditor of the International Harvester Co., Chicago, in that city, April 7. He had been connected with International Harvester for more than 30 years prior to his retirement six years ago.

♦ ♦ ♦

Frank B. Dorman, 77, treasurer and general manager of the Automatic Machine Co., Bridgeport, Conn., in that city, April 8, after a long illness. At one time he was an associate of W. C. Durant in the automotive industry. From 1905 to 1912 he was vice president and general manager of the Maxwell-Briscoe Motor Co., Tarrytown, N. Y.

♦ ♦ ♦

Everett C. Metcalf, 73, since 1896 president of the Westmoreland Malleable Iron Co., Westmoreland, N. Y., and for a number of years prior to that vice president, in Westmoreland, recently. The company, established in 1833, is said to be the oldest malleable iron plant in the country.

♦ ♦ ♦

John R. Davies, 86, the first superintendent of Duquesne works of Carnegie Steel Co. and an early associate of Andrew Carnegie and Charles M. Schwab, in Duquesne, Pa., April 8. He was born in Wales, came to this country at 18, and worked in Chicago in one of the early iron mills

John Hill Whiting

there. In 1889 he became superintendent of the Allegheny Bessemer Steel Co., Pittsburgh, later becoming affiliated with the Carnegie interests. He had been retired since 1903.

♦ ♦ ♦

George W. Nibbe, 45, since 1930 associated with the railroad sales department of Inland Steel Co., Chicago, in that city, April 3. Prior to his association with Inland, he was connected with the Railroad Supply Co., and later with Lundie Engineering Corp.

♦ ♦ ♦

Clifford R. Gardinor, president of the International Silver Co. and a former executive of the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., in Meriden, Conn., April 6. During his 25-year association with International Silver Co., he had been purchasing agent, assistant to the president and later president. In addition to his service with the Westinghouse concern. He had also been with the National Cash Register Co., Dayton, O., and the Columbia Gramophone Co., Bridgeport, Conn.

♦ ♦ ♦

Jesse C. Chambers, 48, master mechanic for the Pullman Car & Mfg. Co., Bessemer, Ala., and formerly associated with Tennessee Coal, Iron & Railroad Co., in Birmingham, April 5.

♦ ♦ ♦

D. B. Sharp, 64, for the past four years connected with American Saw Mills Co., Jacksonville, Fla., and for ten years previous to that Jacksonville manager for Fairbanks, Morse & Co., in that city recently.

Labor

ANNUAL convention of the Amalgamated Association of Iron, Steel and Tin Workers, scheduled to open April 23, last week was shifted from Canton, O., to Pittsburgh. It is generally surmised that this shift was prompted by the belief the atmosphere in Pittsburgh would be more conservative and would make the battle of the rank and file element against the conservative leadership of President Tighe harder.

NSLRB TO SIT AT CHICAGO

National steel labor relations board will shortly sit in Chicago to hear a petition of employes of the South Chicago, Ill., works of Republic Steel Corp., and also probe the discharge of a Youngstown Sheet & Tube Co. employe at East Chicago, Ind., allegedly for union activities.

Miners at Republic Steel Corp.'s Russellton, Pa., soft coal mine in the Western Pennsylvania district returned to work April 8 following a week's strike.

Merger

GOVERNMENT attorneys early this week were expected to file briefs in reply to those submitted last week by counsel for the Republic Steel Corp. and Corrigan, McKinney Steel Co. over the government suit to block the proposed merger of these two companies.

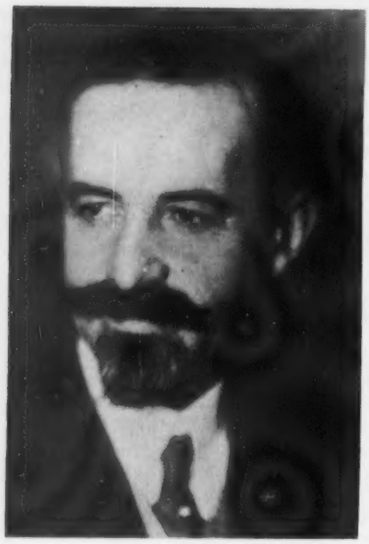
Republic's brief contends that the transaction "is governed by sound, practical business considerations," and if the merger has any effect upon prices "it will be to lower them and to increase the quality of competition in the industry."

Corrigan-McKinney's brief filed in federal district court in Cleveland maintains that the government's case was founded upon an inversion of the meaning of the Clayton act.

Federal Judge Fred M. Raymond, of Grand Rapids, Mich., assigned to the case, is expected to hand down his decision about May. 1.

Industrial Men in the Day's News

Prof. Albert Portevin, Bessemer Medalist, British Iron and Steel Institute



This internationally-known metallurgist and technical writer adds another to his list of honorary awards.

For over 30 years he has been a leading figure in metallurgical investigations carried out in France.

Author of some 300 technical papers, he is a keen student of steels, alloy steels and other metals.

PROF. ALBERT PORTEVIN, awarded the Bessemer gold medal of the British Iron and Steel institute for 1935, is director of Institut de Soudre Autogene and professor at the Ecole Superiore de Fonderie and the Ecole Centrale des Arts et Manufactures in Paris, France.

His name and work have become well known in international metallurgical fields and he has written extensively in technical literature. Receiving his early training at the Ecole Centrale from which he graduated in 1902, he spent a short time in the technical department of the Credit Lyonnais, a bank, and afterward entered the Societe Metallurgique de la Bonneville where he became familiar with the study of steel, copper and brass.

Later he worked in co-operation with Prof. Leon Guillet in laboratories of the automobile works at de Dion, and through reports of his metallurgical investigations attracted attention of Osmond and Henry Le Chatelier. As a result, he was appointed general secretary of the French publication, *La Revue de Metallurgie*, in 1907. He has now published about 300 papers, including 80 read before the French Academie des Sciences.

Papers published by Prof. Portevin since the World war cover a variety of subjects, such as structure of alloys, dilatometric investigations, influence of cooling rates on hardening of steel, heat treatment of light alloys, inclusions in steel, corrosion by chemical action, and steels alloyed with chromium, aluminum, zirconium, nickel-molybdenum and nickel-tungsten.

A recipient of numerous medals in past years, he is currently president of the French association for testing materials, vice president of the international association for testing materials, and president of the international committee on testing cast iron.

♦ ♦ ♦

W. S. Orr, recently returned from Russia in connection with work for the Freyn Engineering Co., Chicago, and formerly chief engineer of the Central Alloy Steel Co., Massillon, O., is now president and secretary of the newly-organized Steel & Engineering Inc., 7501 Thomas boulevard, Pittsburgh, engaged in steel warehousing, manufacture of stampings and of patented steel mill devices.

M. G. Dumas, formerly metallurgist for American Steel Foundries, Chicago, and at one time with Trumbull Steel Co., Warren, O., is vice president and treasurer of the newly organized concern. He is also vice president of the Dumas Engineering Co., Youngstown, O.

♦ ♦ ♦

Ralph A. Terrell has been named chief engineer of the West Pullman (Chicago) plant of Ingersoll Steel & Disc Co., division of Borg-Warner Corp., succeeding S. S. Battles, who has resigned to become president of the Midwest Stamping & Enameling Co., Morrison, Ill. Mr. Terrell was formerly superintendent and chief engineer of the South Bend Tool & Die Co., South Bend, Ind., and previous to that efficiency engineer for Frigidaire Corp., Dayton, O.

♦ ♦ ♦

Donald McDonald, who recently became associated with Aluminum Industries Inc., Cincinnati, has been named a vice president.

♦ ♦ ♦

Oliver F. Redd has been appointed to the research staff of the Patterson Foundry & Machine Co., East Liverpool, O.

♦ ♦ ♦

H. C. Senour, secretary and treasurer of Transue & Williams Steel Forging Corp., Alliance, O., has been elected a director of Mullins Mfg. Corp., Salem, O.

♦ ♦ ♦

T. Lane Watson, salesman in charge of domestic inquiries in the general sales department, rail and billet bureau, Carnegie Steel Co., Pittsburgh, has been appointed assistant manager of sales in the Cleveland district for Carnegie, effective April 15, succeeding A. R. Williard, who died last November.

T. Lane Watson

Mr. Watson was born in Pittsburgh in 1894, and has been affiliated with Carnegie since 1910.

John R. Walker, clerk in the Detroit sales office of Carnegie, has been appointed to succeed Mr. Watson at Pittsburgh. He was identified with Illinois Steel Co. from 1925 to 1930, since which time he has been in the Detroit office.

♦ ♦ ♦

David F. Broderick, president of D. F. Broderick Inc., has been named chairman of the board of the Cadillac Engineering & Mfg. Co., De-

troit, cement mill machinery builder. Arthur F. Miller is president. Arthur W. Roehm, formerly secretary-treasurer of the H. S. Lee Corp. and Cement Mill Equipment Co., is vice president. Mr. Roehm also is factory representative for the Cadillac Malleable Iron Co., Cadillac, Mich.

Homer S. Harrison is chief engineer for Cadillac Engineering & Mfg. Co.

♦ ♦ ♦

W. D. Black has been elected president of the Otis-Fensom Elevator Co., Hamilton, Ont. He has been vice president for many years.

♦ ♦ ♦

Robert L. Dean, mining engineer of McCall, Idaho, has been appointed assistant superintendent of the Woodward Iron Co., Woodward, Ala.

♦ ♦ ♦

Hugh Morrow, president of the Sloss-Sheffield Steel & Iron Co., Birmingham, Ala., has been re-elected a director of the Birmingham Electric Co.

♦ ♦ ♦

N. B. Ornitz, president of National Alloy Steel Co., Pittsburgh, subsidiary of Blaw-Knox Co., Blawnox, Pa., has been elected a director of the parent company.

♦ ♦ ♦

Frederick W. Bierwirth has been elected vice president of the Western Electric Co. and manager of the company's Kearny, N. J., works succeeding the late Stanley S. Holmes.

♦ ♦ ♦

J. Milnor Roberts, identified with the Pittsburgh office of the McClintic-Marshall Corp., Bethlehem, Pa., has been elected president of the Propeller club of Pittsburgh for the coming year.

♦ ♦ ♦

George C. Mueller has resigned as advertising manager of the Sterling Motor Truck Co., Milwaukee, to become associated in the same capacity with the Yates-American Machine Co., Beloit, Wis., woodworking machinery and sawmill equipment.

♦ ♦ ♦

Bartley E. Broadwell, works manager of the Republic Carbon Co., Niagara Falls, N. Y., for the past 17 years, has been appointed consulting engineer of the parent company, National Carbon Co., Cleveland.

♦ ♦ ♦

George H. Ralls has resigned as director of sales of the parts division of Chrysler Corp., Detroit, to become president of Pressure Castings Inc., Cleveland, manufacturer of die castings by a new high-pressure method. He has been prominent in the parts manufacturing business for many years, at one time being associated with the Gabriel Co., Cleveland, manufacturer of shock absorbers.

♦ ♦ ♦

John R. Tillman, for the past several years head of the tool engineering department of the Bullard Co., Bridgeport, Conn., has been appointed assistant to Dudley B. Bullard, vice president in charge of engineering. Mr. Tillman's new post of chief executive engineer combines supervision of all departments of engineering.

John R. Tillman

♦ ♦ ♦

Charles Oliver, vice president of the Oliver Iron & Steel Co., Pittsburgh, and chairman of the 1934 Pittsburgh community fund campaign, has been elected president of the fund for 1935, to succeed William P. Witherow.

William P. Snyder Jr., president of the Shenango Furnace Co., Pittsburgh, has been elected second vice president of the community fund organization.

♦ ♦ ♦

Earl Larsen has been appointed assistant manager in charge of metallurgical research and development of special alloys for the P. R. Mallory Co. Inc., Indianapolis. He was formerly metallurgist for the Driver-Harris Co., Harrison, N. J.

♦ ♦ ♦

L. V. Reese who has been working on the rural rehabilitation program of the FERA, has resigned to become assistant secretary of

Martin Goes to Forging & Casting Corp.

ALFRED K. MARTIN has been appointed vice president, director and chief engineer of the Forging & Casting Corp., of Ferndale, Mich. (Detroit), and is severing his direct connection with the Ludlum Steel Co., Watervliet, N. Y., of which he has been vice president the last five years.

Common stock control of the Forging & Casting Corp. is held by Ludlum, whose interest in the continued progress of the Forging & Casting Corp. is evidenced by this appointment of Mr. Martin.

His experience and association with Ludlum dates back to 1909 when, after graduating from Rensselaer Polytechnic institute with the degrees of civil engineer and bachelor of science, he was employed as a chemist by the small Ludlum organization which had only recently (in 1907) located at Watervliet. Through the positions of assistant superintendent, superintendent of rolling mills, chief engineer, general superintendent and vice president in charge of research and development, his progress was contemporaneous with that of his company.

When Ludlum decided to abandon the crucible process and pioneer in the all-electric-furnace method of manufacture for both tool steels and corrosion and wear resisting steels, Mr. Martin participated in the Ludlum organization's designing and building of its own electric furnace, a two-phase box type furnace, and later in the development from the original two-phase to the present design.

The development of Ludlum silchrome valve steels was accomplished by intelligent and close co-operation

between research and production, and from Mr. Martin's participation in this work probably no operating man in the country absorbed more practical information regarding the future possibilities of the alloy field.

the American Engineering council, Washington. Previous affiliations include American Foundry Machinery Co., Erie City Iron Works, American Metal Co., and United States Metal Refining Co. In his new post he will serve as liaison officer between federal agencies and organized national, state and local professional engineering societies, in connection with the engineers' part in administering the $4,880,000,000 work relief fund.

♦ ♦ ♦

Carl O. Hedner, manager of hoisting equipment sales, Yale & Towne Mfg. Co., Philadelphia, has been elected chairman of the Electric Hoist Manufacturers' association, succeeding Frank F. Seaman, general manager, hoist and crane division, Robbins & Myers Inc., Springfield, O.

Charles A. Moore, chairman of the board, Manning, Maxwell & Moore Inc., New York, has been elected vice chairman of the association.

♦ ♦ ♦

Robert Schaal, for over eight years associated with the Roberts & Mander Stove Co., Hatboro, Pa., has been appointed to handle special work for the Ferro Enamel Corp., Cleveland. He has sailed for England on a special assignment abroad.

♦ ♦ ♦

A. M. Ondreyco, formerly identified with the Westinghouse Air Brake Co., Wilmerding, Pa., is now affiliated with the Meehanite Corp., Pittsburgh. He is vice president of the Pittsburgh Foundrymen's association.

♦ ♦ ♦

K. I. Clisby, who handles sales for the Ohio Electric Mfg. Co., Cleveland, in eastern New York, Connecticut, western Massachusetts and northern New Jersey, with headquarters in New York, has been elected a vice president of the company.

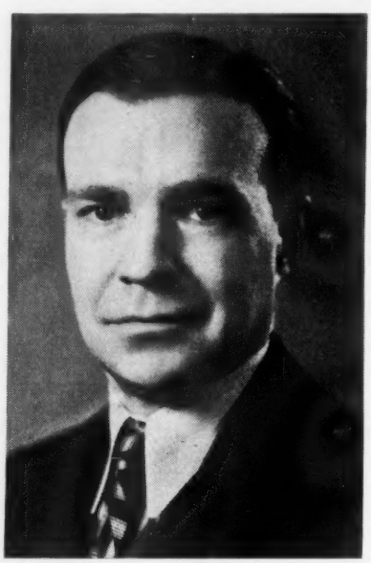
♦ ♦ ♦

Maxwell C. Maxwell, works manager for the Yale & Towne Mfg. Co., Stamford, Conn., has been appointed special assistant to the president, and has transferred his headquarters to New York.

Richard G. Pumley, production manager, succeeds Mr. Maxwell as works manager.

♦ ♦ ♦

William H. Jess has been appointed assistant manager of publications for the Bethlehem Steel Co., Bethlehem, Pa. The publications department, of which John C. Long is manager, handles publishing, news and advertising for Bethlehem. Mr. Jess has been chief of the advertising copy staff and has had 11 years' experience with the company.



William H. Jess

♦ ♦ ♦

A. W. Howe, of Cleveland, has been elected to the board of directors of Sharon Steel Hoop Co., Sharon, Pa., succeeding the late Henry Butler, of Youngstown, O.

A. J. Watson, Warren, Pa., has been named assistant secretary of the company.

♦ ♦ ♦

George M. Verity, chairman of the board, American Rolling Mill Co., Middletown, O., sailed with his wife

(*Please turn to Page* 93)

Convention Calendar

April 22-23—American Zinc institute. Seventeenth annual meeting at Hotel Statler, St. Louis, R. M. Roosevelt, 60 East Forty-second street, New York, is president.

April 24-25—Association of Iron and Steel Electrical Engineers. Spring engineering conference at Ohio hotel, Youngstown, O. T. B. Little, Empire building, Pittsburgh, is acting managing director.

April 24-26—National Metal Trades association. Convention and exhibit in Cleveland. Harvey S. Flynn, 122 South Michigan avenue, Chicago, is secretary.

April 25—American Welding society. Annual meeting at Engineering Societies building, New York. M. M. Kelly, 33 West Thirty-ninth street, New York, is secretary.

April 29-May 1—Concrete Reinforcing Steel institute. Eleventh annual convention at Homestead hotel, Hot Springs, Va. R. W. Johnson, 201 North Wells street, Chicago, is secretary.

May 11-14—National Electrical Manufacturers' association. Spring meeting at Homestead hotel, Hot Springs, Va. R. J. Blais, 155 East Forty-fourth street, New York, is secretary.

May 14-15—American Gear Manufacturers association. Annual meeting at Penn-Lincoln hotel, Wilkinsburg, Pa. J. C. McQuiston, Penn-Lincoln hotel, Wilkinsburg, Pa., is manager-secretary.

May 14-16—American Steel Warehouse association. Twenty-sixth annual convention at Edgewater Beach hotel, Chicago. Walter S. Doxsey, 442 Terminal Tower, Cleveland, is secretary.

May 20-23—National Associaton of Purchasing Agents. Annual convention and exhibit at Waldorf-Astoria hotel, New York. George A. Renard, 11 Park Place, New York, is secretary.

May 22—Porcelain Enamel institute. Annual meeting at Statler hotel, Cleveland. Kurt R. Groener, 612 North Michigan avenue, Chicago, is executive secretary.

May 23—American Iron and Steel institute. Spring meeting at Hotel Commodore, New York. H. H. Cook, 350 Fifth avenue, New York, is secretary.

June 6-7—Gray Iron Founders' society. Meeting at Hotel Gibson, Cincinnati. Henry M. Halsted Jr., Public Square building, Cleveland, is executive vice president.

June 10-13—American Electro-Platers' society. Annual meeting at Stratfield hotel, Bridgeport, Conn. H. A. Gilbertson, 234 South Wabash avenue, Chicago, is secretary.

June 24-28—American Society for Testing Materials. Thirty-eighth annual meeting at Book-Cadillac hotel, Detroit. C. L. Warwick, 260 Broad street, Philadelphia, is secretary.

Aug. 19-23—American Foundrymen's association. Thirty-ninth annual convention at Royal York hotel, Toronto, Ont. C. E. Hoyt, 222 West Adams street, Chicago is secretary.

Sept. 10-21—National Machine Tool Congress (Third). In Cleveland, under auspices of the National Machine Tool Builders' association; Machine Shop Practice division, American Society of Mechanical Engineers; and Production Activity division, Society of Automotive Engineers. Herman H. Lind, 1220 Guarantee-Title building Cleveland, is general manager. National Machine Tool Builders' association.

Sept. 10-21—National Machine Tool Exposition (Third). In Public Auditorium, Cleveland, under auspices of the National Machine Tool Builders' association. Roberts Everett Associates, 225 West Thirty-fourth street, are managers.

Sept. 24-26—Association of Iron and Steel Electrical Engineers. Annual convention and exposition in Pittsburgh. T. B. Little, Empire building, Pittsburgh, is acting managing director.

Sept. 30-Oct. 4—American Institute of Mining and Metallurgical Engineers. Fall meetings of Iron and Steel and Institute of Metals divisions in Chicago. John T. Breunich, 29 West Thirty-ninth street, New York, is assistant secretary.

Sept. 30-Oct. 4—American Society for Metals. Seventeenth annual National Metal congress at Palmer House, Chicago. W. H. Eisenman, 7016 Euclid avenue, Cleveland, is secretary.

Sept. 30-Oct. 4—American Welding society. Fall meeting in Chicago. M. M. Kelly, 33 West Thirty-ninth street, New York, is secretary.

Sept. 30-Oct. 4—National Metal exposition. Seventeenth annual, in International Amphitheater, Chicago. W. H. Eisenman, 7016 Euclid avenue, Cleveland, is general manager.

Sept. 30-Oct. 4—Wire association. Annual meeting in Chicago. Richard E. Brown, 17 East Forty-second street, New York, is secretary.

EDITORIAL

Is New Deal Trying To Aid Or Block Recovery?

COMPANIES identified with the iron, steel and metalworking industries have a bigger stake in the welfare of public utilities than is commonly realized. A large portion of the equipment employed in the production, distribution and utilization of light and power represents orders for the durable goods industries, which in turn draw upon the producers of iron, steel and nonferrous metals for the principal materials of manufacture.

The extent to which prosperity in the public utility field would react to the benefit of these industries is set forth convincingly in the March 30 issue of *Electrical World*. This publication editorially, makes the following flat statement:

> "If encouraged, instead of destroyed, the public utilities can, with the help of other branches of the industry, create now a business of $16,500,000,000, employ 1,000,0000 men and add $1,000,000,000 a year to payrolls. These estimates for a two-year recovery program have been visualized by the industry since last January. . . . Today this program cannot be carried out.
>
> "The investment markets which should supply the needed funds for expansion are congealed with the chaos of reconstruction and reform. Investors are acutely aware of the proposed Wheeler-Rayburn bills. If they are passed in their initial form, those responsible will create a market debacle. . . .
>
> "So long as the enemies of the utility industry wear the cloak of the present administration and disguise themselves and their purposes in the cloth of recovery and reform, there can be no progress."

Public Utilities Have Work for Durable Goods Industries Amounting to Three Billions

Electrical World then goes on to show that of this tremendous potential business, $3,300,000,000 would accrue to the durable goods industries. Of this three and a third billions, the following amounts would be distributed to the iron, steel and metalworking divisions:

Industry	Expenditures Over Two Years	Added Employes Per Year	Added Salaries and Wages Per Year
Iron and steel	$ 675,000,000	48,200	$ 85,500,000
Machinery	730,000,000	65,500	110,000,000
Copper	200,000,000	10,200	16,400,000
Other metals	180,000,000	9,000	14,400,000
Totals	$1,785,000,000	132,900	$226,300,000

Here is impressive evidence of a great volume of potential business that is tied up because the government administration has yielded to the entreaties of the foes of private business. The estimates of the requirements of the public utility companies supplement and corroborate the statement issued recently by the Machinery and Allied Products institute (STEEL, p. 8, April 8, 1935) which indicated that potential machinery requirements of the United States which would "mature with a sound governmental policy and restored confidence" reach the staggering total of $18,574,632,000.

With due allowance for the fact that these and other similar figures are estimates, and therefore may be high or low, it is certain that a huge reservoir of work for the heavy industries has accumulated during the past five years. Also, it is clearer today than at any time since March 4, 1933, that the anti-private industry complex of the new deal is a tangible destroyer of the confidence which would free this stored up volume of business.

Why Waste Billions in Relief When Jobs Can Be Provided by Aiding Private Business?

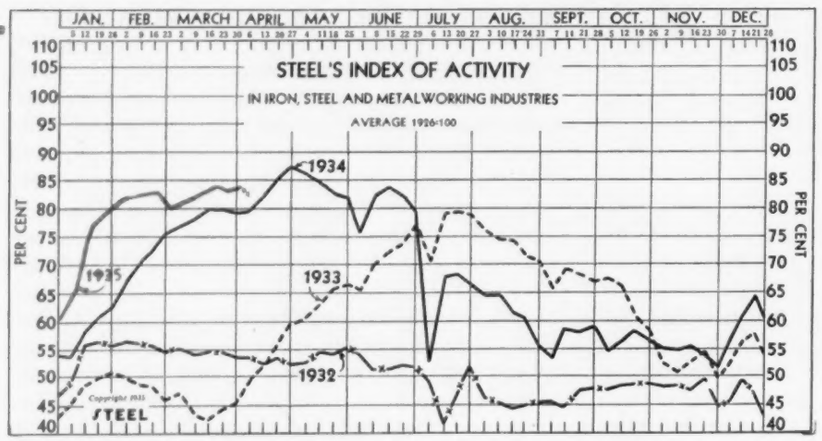
Public resentment against the Wheeler-Rayburn bill and other vindictive, punitive proposals is mounting daily. The rising tide of opposition to the destructive tactics of the new deal should provide an opportune background for a renewed onslaught by industry against the entrenched foes of private business.

Conditions are ripe for a showdown on recovery methods. The administration and a servile congress have just put over a $4,800,000,000 appropriation for work relief, which, according to eminent authority within the President's own cabinet, could have been adequately financed with $1,200,000,000. Much of the unnecessary $3,600,000,000—intentionally or otherwise—inevitably will be wasted through inefficiency or put to questionable political use.

Even now, notwithstanding the fact the work relief bill has been signed, industry has an opportunity to fight for the revival of private business. If successful even in part, it might save some of the $3,600,000,000 which is ticketed for waste.

Every effort should be made to induce new dealers to drop their policy of destruction and to work for the recovery of private business. The public has a right to know why the administration insists upon using extravagent sums for work relief, yet refuses to do the things which would increase private employment. Unless a satisfactory answer is given soon, it will be apparent that somebody is trying to prolong the need of relief work rather than to aid recovery.

THE BUSINESS TREND



STEEL'S *index of activity in the iron, steel and metalworking industries declined 1.2 points to 83.1 in the week ending April 6:*

Week ending	1935	1934	1933	1932
Feb. 9	82.7	70|7	48.7	56.0
Feb. 16	82.8	72.4	48.3	54.4
Feb. 23	80.5	75.5	46.0	55.1
Mar. 2	81.1	78.8	47.4	54.1
Mar. 9	82.0	78.6	43.4	54.8
Mar 16	84.0	79.9	42.7	54.4
Mar. 23	84.0	79.7	44.6	53.5
Mar. 30	84.3†	79.3	45.2	53.4
April 6	83.1*	79.6	49.1	52.6

†Revised. *Preliminary.

The index charted above is based upon freight car loadings, electric power output, automobile assemblies (estimated by Cram's Reports) and the steelworks operating rate (estimated by STEEL*). Average for 1926 equals 100, weighted as follows: Steel rate 40, and car loadings, power output and auto assemblies each 20.*

Plateaus of Stability Are Datum Points of Recovery

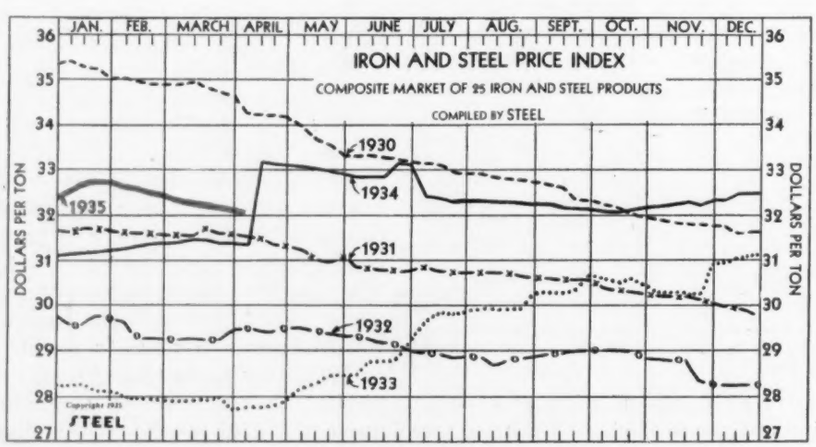
MID-APRIL finds industrial activity clinging closely to the rate established early in February. Looking back to Jan. 1, one can see that the trend was sharply upward in the first month, that the curve in the second and third months was comparatively level with only minor deviations, and that April thus far has witnessed a continuation of the horizontal movement.

The present flat curve is explained by the fact that the ups and downs of the principal factors which influence industrial activity have cancelled each other. It is the third period of stable, sustained activity since the low point of the depression in July, 1932.

First was the four month span of listlessness extending from August to November, 1932. Activity in these months remained almost stationary at about 46 per cent of 1926 levels. The second period of stability occurred in September, October and November of 1934. During these three months industrial activity deviated only slightly from 57 per cent of the 1926 average. In the course of the third stable period—the present one—the average has been about 82 per cent of the 1926 rate.

A comparison of these plateaus of stable activity is more significant as a yardstick of recovery than the usual method of comparing the peaks of each spurt of activity.

STEEL's index for the week ending April 6 dropped 1.2 points, due in the main to the sharp decline in freight traffic occasioned by the reduction in emergency coal shipments which occurred when the anticipated miners' strike failed to materialize.

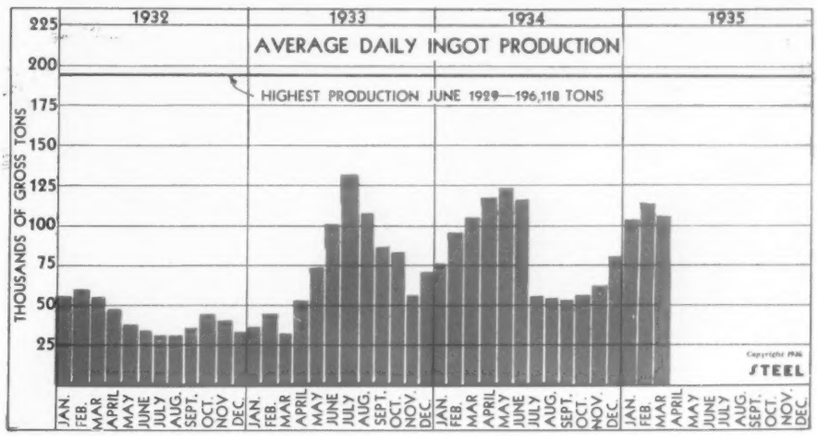


1935	
April 6	$32.27
Mar. 30	32.30
Mar. 23	32.33
Mar. 16	32.38
Mar. 9	32.39
Mar. 2	32.42
Feb. 23	32.50
Feb. 16	32.54
Feb. 9	32.56

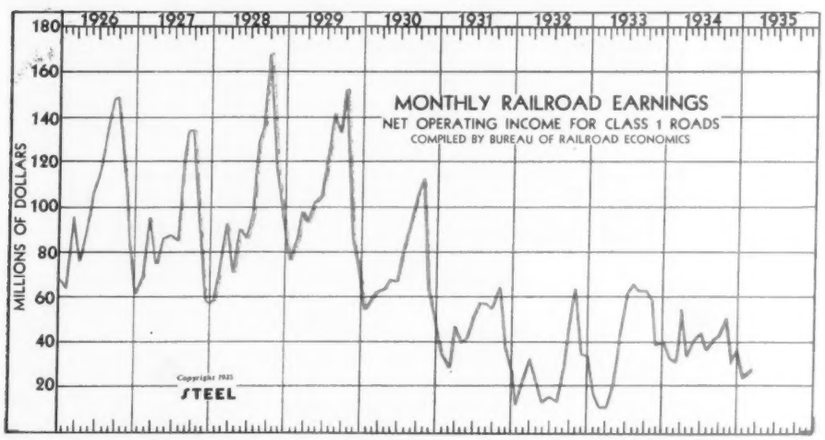
1934	
April 7	$31.33
Mar. 31	31.34
Mar. 24	31.34
Mar. 17	31.42
Mar. 10	31.43
Mar. 3	31.36
Feb. 24	31.34
Feb. 17	31.33
Feb. 10	31.30

March Ingot Rate Lower; Exceeds Year Ago

	1935	1934	1933
	Gross Tons		
Jan.	104,969	73,007	39,110
Feb.	114,255	90,965	44,709
March	108,873	102,275	33,268
April		115,912	53,817
May		124,177	73,201
June		116,006	98,632
July		58,912	126,734
Aug.		50,503	106,058
Sept.		50,068	87,811
Oct.		54,151	80,188
Nov.		61,126	58,507
Dec.		77,664	71,944



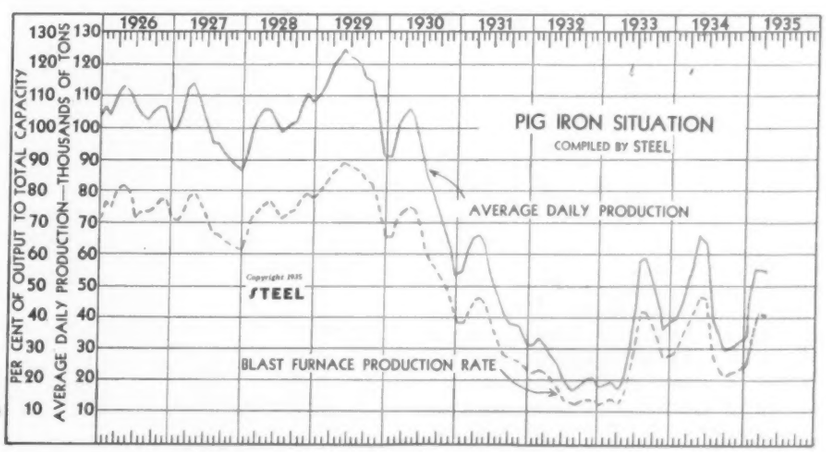
Railroads Earn 1.57% In First Two Months



	1935	1934
Jan.	$21,348,557	$30,931,202
Feb.	25,719,919	29,281,013
Mar.		52,037,848
Apr.		32,264,610
May		39,494,978
June		41,836,302
July		35,220,809
Aug.		39,677,337
Sept.		41,020,485
Oct.		48,624,984
Nov.		31,582,704
Dec.		38,729,833

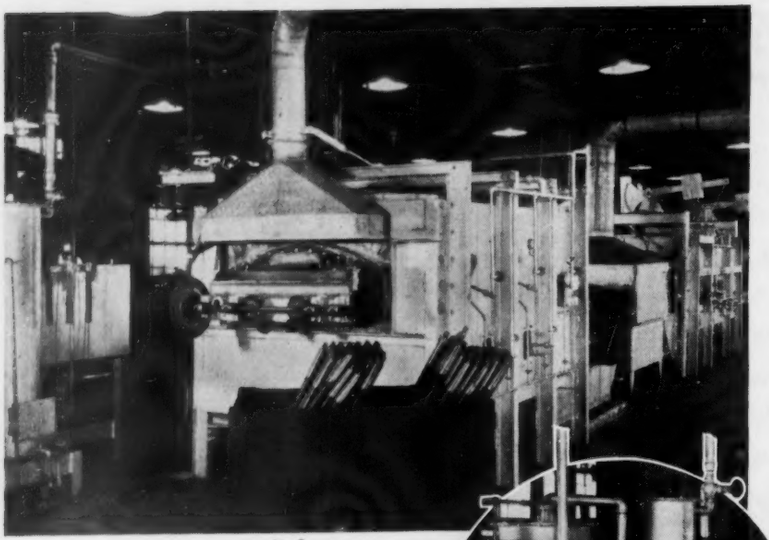
March Iron Output Up But Daily Rate Declines

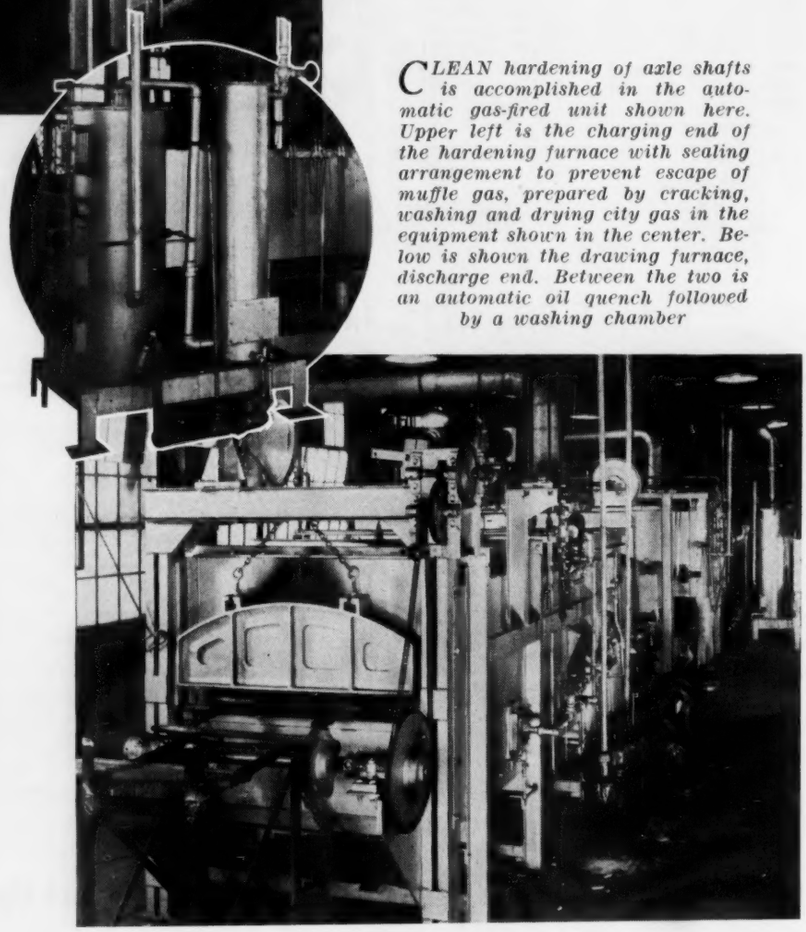
	Daily Average		Blast Furnace Rate	
	1935	1934	1935	1934
Jan.	47,692	39,537	34.2	28.3
Feb.	57,686	45,385	41.4	32.5
Mar.	57,120	52,438	41.0	37.5
Apr.		57,873		41.4
May		66,370		47.5
June		64,563		46.3
July		39,630		28.4
Aug.		34,199		24.5
Sept.		29,969		21.5
Oct.		30,689		22.1
Nov.		31,930		22.8
Dec.		33,161		23.7



Atmospheres

New Furnaces





CLEAN hardening of axle shafts is accomplished in the automatic gas-fired unit shown here. Upper left is the charging end of the hardening furnace with sealing arrangement to prevent escape of muffle gas, prepared by cracking, washing and drying city gas in the equipment shown in the center. Below is shown the drawing furnace, discharge end. Between the two is an automatic oil quench followed by a washing chamber

HEAT treating of steel has made great strides since its early introduction as an adjunct to manufacturing operations. Probably no single stimulus to this development has been greater than that imposed by the needs of the automotive industry. Here the demand over the past 25 years continually has been for steels with special properties—hardness, toughness, high strength, resistance to impact. Steel treaters, as heat treating specialists have come to be known, have constantly felt the spurs of automobile manufacturers in the form of greater demands upon metals in transportation equipment.

In fact, it was in the automotive industry that the science of heat treating cut its baby teeth. Among the various manufacturers, Packard is well known for pioneering work in heat treating; and even today this maker is quick to take advantage of modern improvements in heat treating practice. Only recently, two new furnace units were installed at the Packard Motor Car Co., Detroit, for specialized heat treating.

Camshafts Gas Carburized

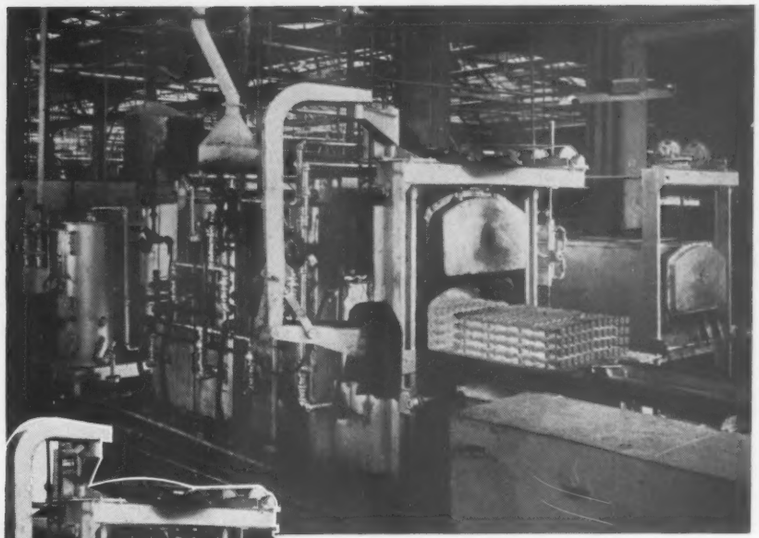
One is a batch-type gas carburizing muffle furnace for carburizing camshafts. It is located in the recently re-equipped building where the Packard 120 model is assembled. The carburizing gas is propane which before use is cracked with about nine parts of air to one of propane, at 1700 degrees Fahr. Analysis of the cracked gas is approximately 2 per cent CO_2, 15 per cent CO, 8 per cent methane or CH_4, and 18 per cent hydrogen. The cracked gas is passed through a water spray to condense out water vapor, and then through a dryer of excelsior and to the furnace under an orifice-type flowmeter.

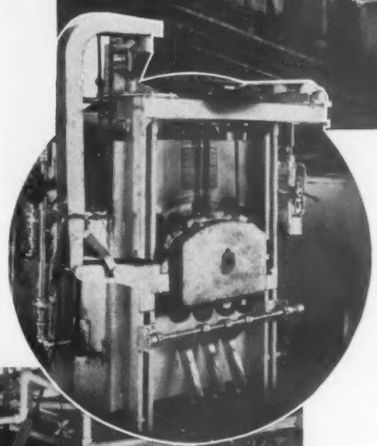
Shafts are received from machine department and stacked on heat-resisting alloy trays in two piles of 48 shafts each, four shafts high and 12 wide. Special charging equipment, running on a track in front of the furnace is used to move the charge into and out of the muffle. Charging trays slide on two alloy steel rails on the floor of the muffle. After the shafts are charged, cracked gas alone is admitted to the muffle for 2½ hours; then raw propane is added to the carburizing gas in the proportion of two parts cracked gas to one part raw propane. Temperature is brought up to 1775 degrees Fahr. After being exposed to the gas for 13 hours the charge is removed from the furnace by the motorized pusher and placed in a cooling chamber immediately adjacent to the carburizing furnace and resembling the latter in shape and size.

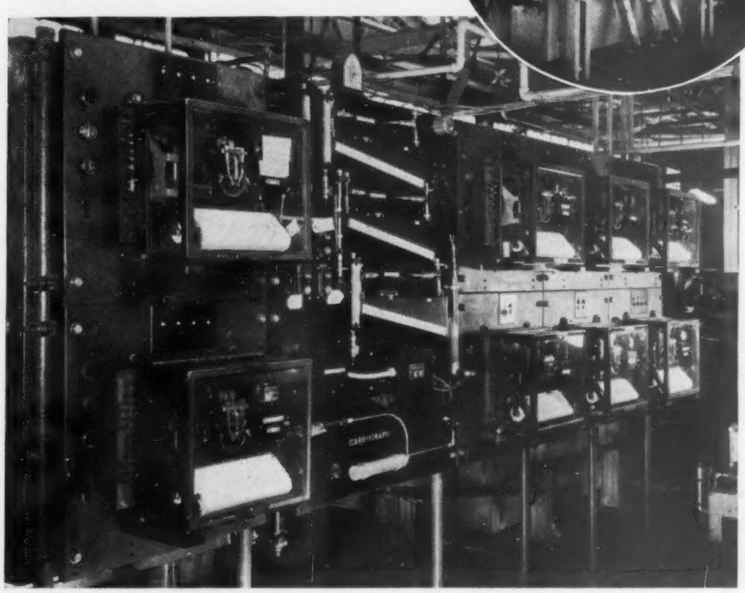
The cooling chamber is maintained by gas burners at a temperature of 1000 degrees Fahr. When the hot shafts are charged into it, the temperature rises to about 1375 degrees

BY A. H. ALLEN
Associate Editor, STEEL

Controlled in at Auto Plant







CAMSHAFTS are gas carburized with this equipment. Upper right shows a load of 96 shafts being removed from the carburizing unit, to be transferred to the cooling chamber at the extreme right. Center insert shows the furnace as it appears in operation, with the double door sealed shut by clamps. Below are control instruments for the installation, including a carbograph, in the center, which checks on analysis of the carburizing gas

after four hours and gradually decreases. When the temperature falls to 1000 degrees the charge is removed and allowed to cool in air. Total depth of case over 0.50 per cent carbon ranges from 0.065 to 0.075-inch. The shafts are of S. A. E. 1020 steel.

After carburizing, the shafts are straightened and machined, the distributor gear being cut in the shaft at this stage. They are then taken to a deep, circular cyanide pot, and hardened in groups of eight or ten, being hung on racks and lowered into the cyanide. Final hardness ranges from 60 to 63 Rockwell C. The gear is cyanided to a depth of 0.004-inch. A thorough wire brushing follows, followed by a second straightening operation.

The final operation before assembly is in automatic cam grinding machines where the shafts are loaded one at a time and automatically indexed through several grinding operations to obtain the desired profile on the cams.

In operation of the carburizing furnace, the aim is to obtain turbulence of the gas and to avoid pockets and stagnation. The gas must circulate continually around the charge if proper penetration is to result. Seven inlets for the carburizing gas are provided and they are placed at such angles that turbulence is assured.

To check on analysis of the carburizing gas, a device known as a carbograph is employed. This is in operation as long as carburizing gas is being admitted to the furnace. It comprises a tube in which a small amount of the gas is burned, the flame playing on the end of a thermocouple which records on a moving chart. A change in the analysis of the gas is registered quickly as a change in temperature of the flame and by a series of experiments the correct temperature for efficient carburizing is known and the mixture can be adjusted correspondingly.

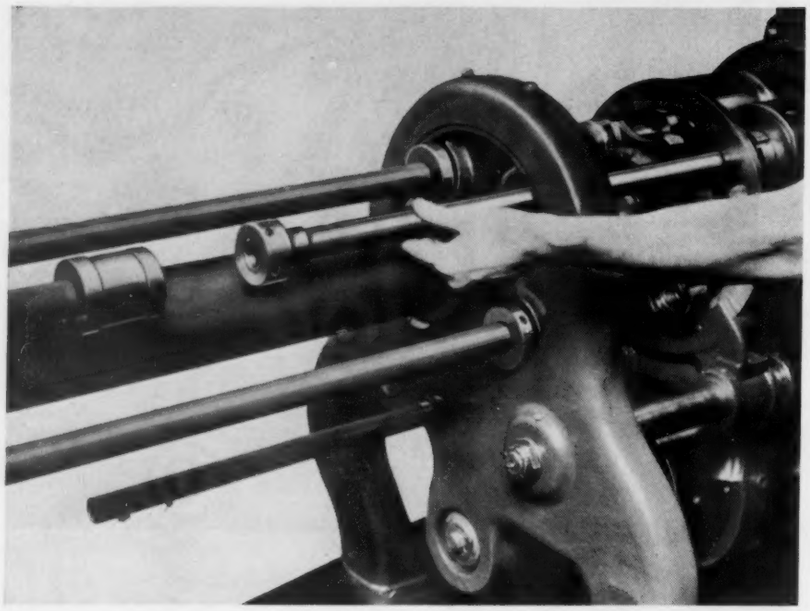
Cleaner and Faster Operation

The complete carburizing furnace installation was designed by the Surface Combustion Corp., Toledo, O., and was installed, not because satisfactory results were impossible with pack carburizing, but as a means of lowering carburizing costs, cutting time required, and improving working conditions by virtue of the cleaner features of gas carburizing as opposed to using boxes and compound.

Another Surface Combustion Corp. installation has been made recently in another division of the Packard plant, for scale-free hardening and drawing of rear axle shafts. These shafts, about 32 inches in length, are of S.A.E. 4140 chrome-molybdenum steel and are hardened, oil quenched and drawn continuously at a rate of 80 pieces per hour. The resulting product is entirely scale-free, thus eliminating a sandblasting operation formerly required after hardening and quenching.

The rough-forged shafts are machined on one end, threads cut on the other and brought to the furnace by truck. The hardening unit is

(*Please turn to Page* 41)



Stock reel tubes on small machines are mounted on antifriction bearings and are free to rotate with the stock

Changes in Screw Machines Improve Performance

SMALLER models of Gridley automatic screw machines, made by the National Acme Co., Cleveland, have been placed on the market with a novel type of direct motor drive which is applied directly to the machine so that the driveshaft of the motor becomes the driveshaft of the machine as well, and the use of sprockets and silent chain is eliminated. It also eliminates the necessity for cast iron motor plates with provision for adjustment in the length of the chain. It eliminates the cost of the guard and to some extent improves the visibility in the shop by eliminating just one more object which protrudes above the line of sight of the operator.

Rigid Support on Machine

The motor is a standard squirrel cage type, to which is applied a special end bracket of heavy section, which is also doweled and bolted securely to the end of the machine. In this way, vibration is minimized and the motor is supported rigidly and becomes a part of the machine. Into the rotor of the motor is introduced a special driveshaft on the outer end of which is mounted the spiral bevel gear which meshes directly with the transmission of the automatic screw machine. The shaft is supported by antifriction bearings of generous proportions which are served by an automatic forced feed lubricating system in the top of the machine.

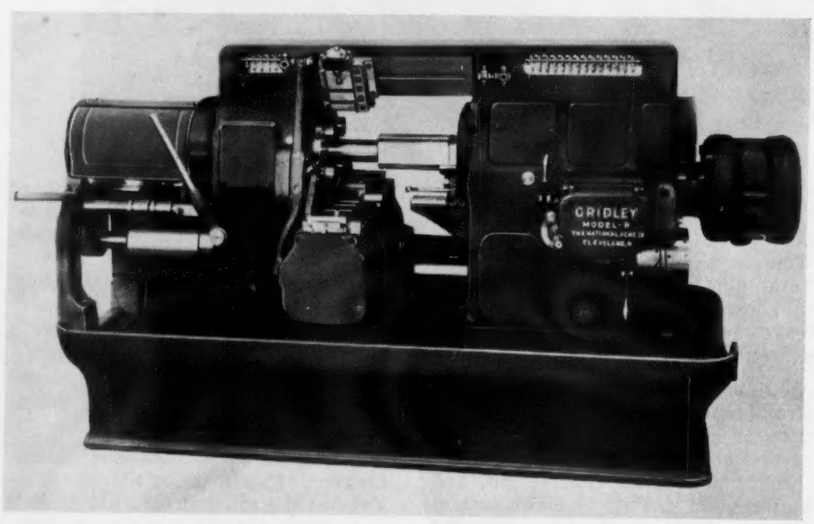
In this small size the motor does not protrude far beyond the end of the machine and, therefore, takes up little additional space in the shop, thus being free of the objection that applies to mounting a motor in the base of the machine where it is not only exposed to an oily atmosphere and the possibility of chips getting into the windings and causing short circuits, but where it is hard to inspect and clean and where it also reduces chip capacity, which is so important on these modern high production automatic screw machines.

Another important change in the design of automatic screw machines made by this company has to do with the stock reel. In these smaller machines, the spindle speeds now available by use of antifriction bearings and positive forced feed lubrication have been increased substantially, so that it is possible for a ⅞-inch machine actually to handle economically a ¼-inch brass rod. These increased speeds in turn mean that if a crooked piece of bar stock 12-feet long is rotated at extremely high speed in the stock reel it is likely to have its corners rubbed off on the inside of the stock reel tube, if the bar stock happens to be square, hexagonal or some extruded shape.

Tubes Rotate with Stock

To eliminate this possibility, the stock reel tubes on these small machines are mounted on antifriction bearings and are free to rotate with the stock. To give the stock reel the necessary rigidity, a tubular backbone is welded into the disks. The disks in turn are mounted on rollers on stands which are adjustable so that they will line up exactly with the center of the machine. An additional feature is the quick removing principle, so that the operator, by grasping any one of the stock reel tubes, can pull it back away from the machine, thereby making it possible for him to remove the pusher tube from the machine and change to a different size pusher in a few minutes. This can be done without the use of a wrench and without loosening the stock reel tube in each of the several disks.

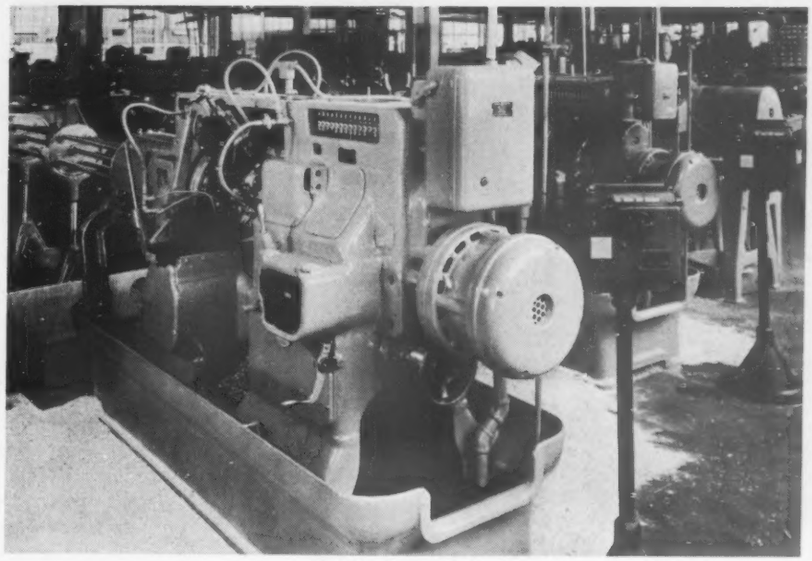
Further increase in the production



With the motor mounted on the machine so that the shaft of the former becomes the driveshaft of the machine as well, the use of sprockets and chain is eliminated

available from automatic screw machines has been obtained by making a careful study of the sources of idle time, with chronologs manufactured by National Acme, described in STEEL for Oct. 3, 1932. The chronolog provides a printed record of production, shows when the machine was interrupted, why it was interrupted and how long the interruption continued. They can be arranged to flash a red signal light when stock has been exhausted and needs to be replenished.

By revealing the causes of lost time and pointing to those which are more serious, they make it possible to remedy the situation and improve output of the machine. It is not unusual for automatic screw machines, on some rather difficult work, to average over a period of weeks an efficiency of over 83 per cent, which without the chronolog is a difficult efficiency to maintain. It has been found by actual experience the operator welcomes the chronolog as a means toward increasing his own piecework compensation and also as a means of properly apportioning the responsibility for delays which, while they affect the operator's earning, are not entirely his fault, but are caused by the services which are supposed to co-operate with the operator, such as stock supply, chip removal, toolroom, and the like.



Battery of screw machines equipped with chronolog devices which provide printed records of production time and idle time. By their use, average efficiency is claimed to be boosted to over 80 per cent

Inventory Control Methods Summarized in Report

Not least important among problems of management of an industrial organization is the effective control of production materials, to keep stocks on hand as needed and yet to avoid excessive inventories. In recent years, as evidenced by a recent survey made by the Metropolitan Life Insurance Co., many companies have sought to refine their inventory control methods. Their experiences are presented in a report, *Inventory Control Methods.*

The report points out that the principal advantages of a system of inventory control have proved to be two-fold:

(1) *Economies from an investment standpoint.* The control of the physical size of stocks, by the development of the most economical quantities and varieties to be carried, promotes more rapid turnover and minimizes the investment in inventories. Direct economies result in the reduced cost of taxes, insurance and storage and handling facilities.

(2) *Economies from an operating standpoint.* By assuring an available supply of materials when needed, production and maintenance operations are facilitated and the expense of idle men and equipment waiting for materials minimized. Similar control as applied to finished stocks means better service to customers.

The report discusses types of inventory records, reviews various forms of stores ledgers, considers inventory classifications, records for quantity only, records including inventory values, average cost plan, "oldest lot first" plan, and standard cost plan. In order to enhance the usefulness of the report, reproductions of a number of forms discussed are included.

Copies of the report may be had by addressing the policyholders service bureau, Metropolitan Life Insurance Co., 1 Madison avenue, New York.

Atmospheres Controlled in New Furnaces at Packard

(*Concluded from Page* 39)

served by a continuous heat-resisting alloy belt. At the charging end is a special device for conveying the shafts into the furnace without admitting any air at the same time. It involves a series of slots in a cylinder which turns at a slow rate. The shafts are charged in these slots and as the cylinder turns they are moved into the furnace chamber. At the discharge end the shaft slides down an enclosed chute onto a table arrangement which through a series of chains and counterweights lowers the hot shaft into the quenching oil.

It is then transferred automatically onto another conveyor which moves it up out of the quench into a washing chamber, enclosed in sheet steel and connected to a duct for removing fumes. In this chamber the shafts are subjected to the action of a special solvent which thoroughly removes all traces of oil and sludge. Discharge side of the washing chamber is immediately adjacent to the entrance to the drawing furnace, into which the conveyor moves the axles. Thus, from the time the shaft is charged until it enters the drawing furnace, it never comes into direct contact with the atmosphere.

Cracked City Gas Used

Hardening temperature is 1540 degrees Fahr. The furnace is fired with gas burners, six on a side, staggered to give proper turbulence to hot gases around the muffle. Atmosphere in the muffle is maintained reducing by means of cracked city gas under pressure of 3 inches of water. A separate cracking unit prepares this gas, as in the case of the carburizing furnaces. Analysis of the cracked city gas shows about 8 per cent CO and 5 to 7 per cent CO_2. After cracking, it is passed through a water spray condenser and excelsior dryer and then into the muffle. Complete sealing of the muffle at both ends prevents any oxidation of the hot shafts as they pass through the furnace.

Oil in the quench tank is circulated constantly and is cooled as well. Cooling equipment is located underneath the tank.

The drawing unit is fired by gas burners and is operated at a temperature of 850 degrees Fahr. to bring the shafts to a finished hardness of 400 brinell, compared with original hardness before heat treating of 187 brinell. The conveyor on this furnace is geared up with the conveyor on the hardening furnace and the quenching apparatus so that the shafts pass through the complete installation at a uniform speed. A single motor operates this equipment through chain drive.

CONTRASTS IN THE SPRING FAMILY! The pile of 5100 small springs at the right weighs 1 ounce; the automobile coil spring at the left weighs 14½ pounds

STEEL at $200,000 a ton! That is more than 11 times the value of a ton of silver based on a market price of 55 cents per ounce; yet for the smallest open-wound helical steel springs produced this is the market value. There would be 167,000,000 of these small springs to the ton. However, they are sold by the pound or fraction of a pound and the high value of the product largely represents the cost of mechanical skill and genius employed in its production. Here is a description of the operations and materials used in making these feather-weight springs at the Worcester, Mass., plant of the American Steel & Wire Co.

Mechanical Skill Paramount in Production of Small Springs

BY L. E. BROWNE
Associate Editor, STEEL

IN THESE days of heavy coil springs for automobiles, it is of interest, by way of contrast, to learn something of the methods and materials used in manufacturing what are claimed to be the smallest open-wound helical springs produced.

The American Steel & Wire Co., subsidiary of United States Steel Corp., has large spring-making plants at Waukegan, Ill., and Worcester, Mass., each of which is equipped to design and manufacture many types and sizes of springs. This description relates to the Worcester plant.

Among the 160,000 and more items of springs and formed steel recorded, tiny springs used in typewriting and tabulating machines, in delicate electrical switch mechanisms and in metal straps for wrist watches, represent the smallest of their kind which have been designed to exert a holding or compressive force in actual service. Intricate parts of tabulating machinery must be controlled accurately and must respond instantly to the slightest touch. Small electric contacts, such as those in the higher grade mechanical toys, must operate positively in their restricted space. Metal wrist watch bands are made up of sliding segments, given the required flexibility and comfortable tension by use of these miniature springs.

The service demanded of these Lilliputians of the spring world calls for the use of music wire, the finest known quality of spring wire, manufactured by a special procedure from carefully selected steel. A fair indication of the care used in manufacturing this high quality wire can be given by a brief outline of the many processes through which it must pass before it reaches the finished size, which for these tiny springs is only 0.005-inch in diameter. Tensile strength of the wire is approximately 400,000 pounds per square inch.

Cold Drawn and Annealed

The hot-rolled rod, about ¼-inch in diameter is converted by a series of successive cold drafts and subsequent heat treatments, about 40 drafts and four or five heat treatments, to its finished size. The carefully prepared rod first is heat treated by the process known as patenting, a treatment which produces uniform grain structure, especially adapted to withstand the strain of many cold drafts, resulting in rapidly increasing tensile strength, with minimum loss of ductiilty. Cleaned free from scale by quick acting acids, it is drawn through alloy steel dies with repetition of heat treatments and of cleaning operations at required intervals, until the wire has reached a size approximating 0.030-inch. At this point the steel is given a soft metallic coat of special alloy and drawn further.

The final step consists of 16 consecutive drafts through diamond dies. These diamonds are enclosed in suitable metal cases, placed in the respective pockets, and flushed with a liquid lubricant.

The finished wire, upon delivery to the spring department, is led into a small machine especially designed to coil the most delicate of springs. Although at normal speed such a machine will produce more than 100 springs a minute, it is necessary, when making these miniature sizes, to reduce the machine speed by more than half, to prevent the breakage or buckling of the extremely fine wire as the feed rolls push it through the finely machined guides against the coiling point and around the arbor, which is constructed of a small piece of music wire split in half, lengthwise.

The operator of the small spring coiler uses a jeweler's glass to aid in the adjustment of his machine.

The heaviest of these minute

springs are so small one pound represents 56,000 springs, while a pound of the smallest represents 83,000 individual springs. These figures seem more readily understandable, however, when it is realized that the smallest of these coils is only 0.045-inch in diameter, while the others are but slightly larger, one being 0.065-inch in diameter; and they measure only 5/16-inch in length for the shortest up to ½-inch for the longest, 1000 of which weigh a scant 0.018-pound.

The steel industry and those engaged in the production of steel and wire usually talk of capacities and mill operations in tons. But a ton of these diminutive springs represents well over a hundred million pieces (167,000,000 of the smallest) with a value per ton approximating $200,000. A large part of this amount represents the charge for mechanical skill employed in the actual forming of the springs, rather than the cost of the material.

The much publicized "knee-action" automobile spring of current design has a deflection rate of approximately 150 pounds per inch of movement, while heavier coil springs from 2-inch rod, weighing around 75 pounds each, may have a carrying capacity up to 50,000 pounds. But the midget springs just described exert a force of hardly 1 ounce.

Gear Makers Announce Program for Meeting

Seven technical papers are scheduled for presentation at the annual meeting of the American Gear Manufacturers' association to be held at the Penn-Lincoln hotel, Wilkinsburg, Pa., May 14-15, according to the tentative program just announced. In addition, a full report will be made on the code of the industry and the status of NRA. Another special feature of the meeting will be an address "Where Do We Go from Here," by J. H. Van Deventer, editor of *Iron Age*, New York.

Technical papers and their authors are as follows:

"Methods for Checking Gears," by D. T. Hamilton, Fellows Gear Shaper Co., Springfield, Vt., in collaboration with Robert Beardsley, Jones & Lamson Machine Co., Springfield, Vt.

"Inspection Methods that Give a New Conception of Gear Accuracy," by S. O. Bjornberg, Illinois Tool Works, Chicago.

"Heat Treatment of Miscellaneous Gearing," by Jordon Korp., Leeds & Northrup Co., Philadelphia.

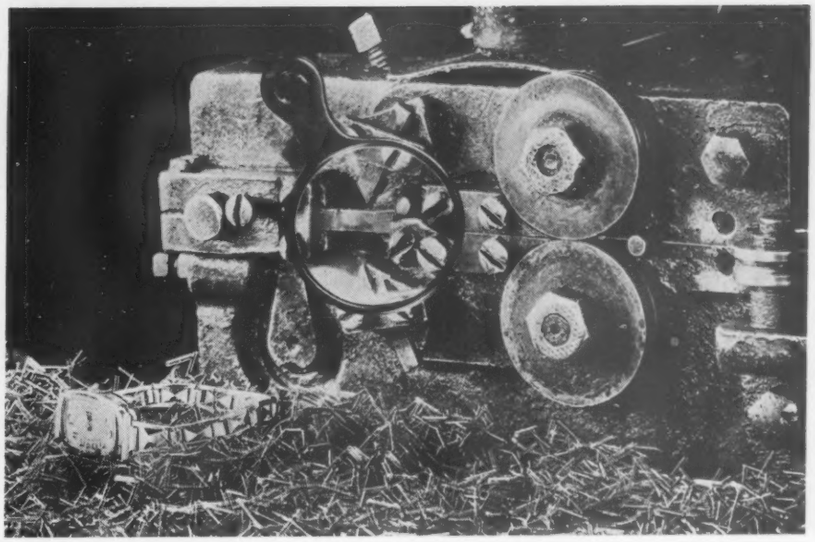
"Science of Seeing," by representative of General Electric Co., Schenectady, N. Y.

"New Machine for Finishing Gears by Rotary Shaving Process," by R. S. Drummond, National Broach & Machine Co., Detroit.

"British Standards," (with particular reference to worm gears), by Prof. Earle Buckingham, Massachusetts Institute of Technology, Cambridge, Mass.

"British Standards," (with particular reference to bevel and spiral bevel gears), by F. E. McMullen, Gleason Works, Rochester, N. Y.

J. C. McQuiston, Penn-Lincoln hotel, Wilkinsburg, Pa., is secretary-manager of the American Gear Manufacturers' association.



Coiling machine on which small open-wound helical springs are formed from music wire at a rate of about 50 per minute. A small spring in process of being wound is visible through the magnifying glass. Many of these small units are used in metal link straps for watches such as that shown in the left foreground

Header Die Life Is Increased

UP UNTIL a year ago, the Chandler Products Corp., Cleveland, was employing the pack method for hardening header dies. Before these dies could be used, they required considerable refinishing and this was not only an item of expense but a loss of time in getting them into service. To overcome these difficulties, the company installed a retort-type, controlled-atmosphere electric furnace which has completely eliminated the old protective pack hardening method and the protective coating of the steels.

Describing the new installation in the March issue of *Electrical Production Magazine*, B. P. Appel, the company's superintendent, states that work in the furnace is protected by a slightly carburizing atmosphere which cannot act as a carburizer at normal hardening temperatures with normal tool steels but which gives positive protection to the carbon originally in the surface of the steel. Results of a year's operation are extremely satisfactory; there is no scaling, breaking in hardening has been reduced to a minimum, and distortion is eliminated.

Dies hardened in the controlled atmosphere furnace are claimed to give approximately 25 per cent more service than those heat treated by the old method. Prior to installation of the new equipment, dies showed an initial wear of 0.001-inch practically at the beginning of their service; now the dies change size very gradually and are in service a considerable period of time before a wear of 0.001-inch takes place.

Heating time was not accurately controlled by the old method and this often resulted in premature breakage of the dies in service. The controlled atmosphere furnace has automatic control which records the rate of heating and when the work passes through its critical range, so that it is now possible to regulate the rate of heating to limit breakage. No undesirable results have been experienced from the increased exposure of the steel to temperatures which ordinarily would scale the highly finished tools.

This also holds true for other tools which formerly had to be finished with grinding allowance, says Mr. Appel. The tools are now finished in the toolroom to final dimensions and put into operation after hardening and drawing without any further finishing operations. By increasing the rate of cracking of the oil in the cracking unit, it is possible to do carburizing in the new furnace.

Through use of the new furnace, the company has been able to utilize a low-priced carbon tool steel in place of high-priced alloy steels for header dies and other tools.

METHODS AND MATERIALS

Alloy Steel Castings Meet Strenuous Duty

During the past year, the Texas Electric Steel Casting Co., Houston, Tex., was called upon to cast parts for a specially designed new device for driving sheet steel piling. According to a brief article appearing in the February issue of *Nickel Steel Topics*, published by the International Nickel Co. Inc., New York, the service to which this tool was put was quite severe, since it was necessary for the piling to penetrate approximately 10 feet of old concrete lying about 15 feet below the surface of the ground. The total weight of the assembled tool was 5500 pounds, of which 5200 pounds were steel castings.

The first tool, in which these parts were made of medium carbon unalloyed steel, could not withstand the combined shock and abrasion on this strenuous job, and it was decided finally to employ a pearlitic nickel-manganese steel. This proved to be highly satisfactory, and the original tool still is in serviceable condition. Composition of the steel was 0.32 per cent carbon, 1.16 per cent manganese, and 1.30 per cent nickel; physical properties were: Yield point, 58,000 pounds per square inch; tensile strength, 102,000 pounds per square inch; elongation in 2 inches, 25 per cent; and reduction of area, 43 per cent.

\$ \$ \$

Man's Working Efficiency Is Less at High Temperatures

Many occupations require working under high temperature conditions. Man loses his efficiency beyond certain temperatures. At rest, in still saturated air, the upper line is about 90 degrees Fahr. If an air movement of 200 feet per minute is set up, the limit rises to 95 degrees. Stripping to the waist helps, while muscular work lowers the limit, according to a report entitled "Air Conditioning Facts," recently prepared by Ford, Bacon & Davis, 39 Broadway, New York.

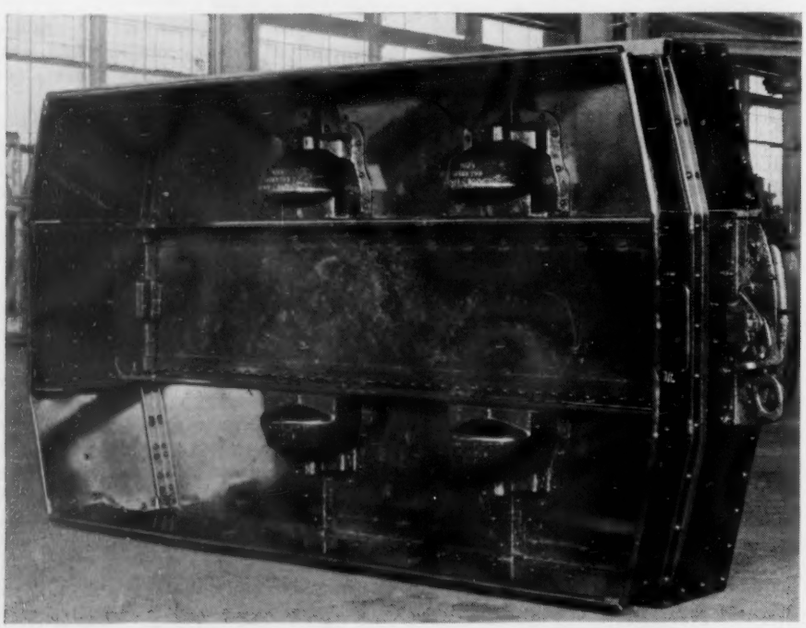
When the limit is exceeded normal sweating no longer is sufficient and

Wanted—Stainless Steel To Meet Dental Requirements

"I wish to know," states a letter to the editor of STEEL, "where I could purchase, for distribution to all dental laboratories in the United States, a stainless steel alloy in the form of ingots weighing about 1 ounce each and which can be melted by using the oxyacetylene flame. The alloy must be really stainless and the melting point not so high as to crumble the mold when it is spun at the instant of casting a dental plate.

"Price per pound of the alloy is not so important as quality. For the right alloy I can get a good, immediate market. Will you please give me your best advice on this matter?"

Light Weight Mine Car



WEIGHT OF THIS MINE CAR, formerly made of ordinary mild steel, was cut approximately 30 per cent by constructing it of high strength steel. The builder of the car is the Western Gas Construction Co., Fort Wayne, Ind., and the supplier of the high strength steel sheets from which it is made is the Alan Wood Steel Co., Conshohocken, Pa.

changed physiological reactions appear. The pulse quickens. The skin flushes and profuse sweating ensues. This reduces the volume of liquid in the system causing a rapid pulse. Headache, palpitation and extreme thirst are first noticed. Dizziness and confusion follow. Then nausea and numbness of the face with a final feeling of "floating in the air." The heat wave in the mid-west affected many in this way and caused hundreds of deaths.

When subjects are returned to normal temperatures their condition promptly improves, with an after effect only of lassitude and thirst.

Man can perform four times more work at 100 degrees Fahr. with the humidity at 30 per cent than he can at 100 per cent. He can perform five times as much work at 90 degrees as he can at 120 degrees (with 60 per cent humidity). High temperatures have a tendency to increase accidents.

The control of working conditions may therefore increase output in some plants.

Dust may be harmful to the respiratory system, for in some instances the fiber of the lungs may be changed. Free silica in too great quantities may cause silicosis. The use of pneumatic tools is a chief source of this dust. Lead, and arsenic dust are, of course, poisonous.

There are many types of simple air filters that may be helpful in removing these dusts. They employ viscous films, dry mats, centrifugal collectors, electrical precipitators or washers. A humidity of 50 per cent as a rule will "lay" ordinary dust.

$ $ $

Use of Neutralizer in Enamel Pickling Bath

Sodium cyanide has been found to be effective as an addition to the neutralizing bath in the pickling of sheet iron for enameling, according to E. H. Shands, G. L. Bruten and J. L. Grimes, Detroit Vapor Stove Co., Detroit, who jointly presented a paper on this subject before the annual meeting of the American Ceramic society in Buffalo recently.

A water rinse should always be used between the acid bath and the cyanide neutralizer, as free acid will cause poisonous hydrogen cyanide gas to be given off. This neutralizer must always be kept alkaline, and then there is no danger connected with its use.

Addition of sodium cyanide greatly increases the life of the neutralizer solution, and is helpful because of its ability to dissolve iron salts. Blistering and copperheading of the enamel was greatly reduced by using this neutralizer. This is probably due to the fact that this sodium cyanide tends to prevent excess oxidation of the pickled iron.

$ $ $

New Mining Cable Highly Resistant to Abrasion

A new cable with loom-woven sheath, for use on mining machines, reel locomotives, and other applications of a similar nature where the cable must withstand severe mechanical abrasion, is now available from the General Electric Co., Schenectady, N. Y.

The finish of this cable consists of a circular-loom-woven sheath, applied in a manner similar to the weaving of a carpet. Under this sheath is a layer of glyptal cement, the sheath being so applied that it is embedded in the glyptal cement and partially embedded in the rubber insulation. This process results in a cable that is tough, extremely abrasion resisting, and, because of the glyptal cement, highly resistant to oil, alkali and acid.

$ $ $

Aluminum Paint in Molds

Chill plates which form the bottom face of the molds in which automobile engine valve tappets are cast are prevented from developing a film of rust by the application of a coat of highly refractory aluminum paint.

$ $ $

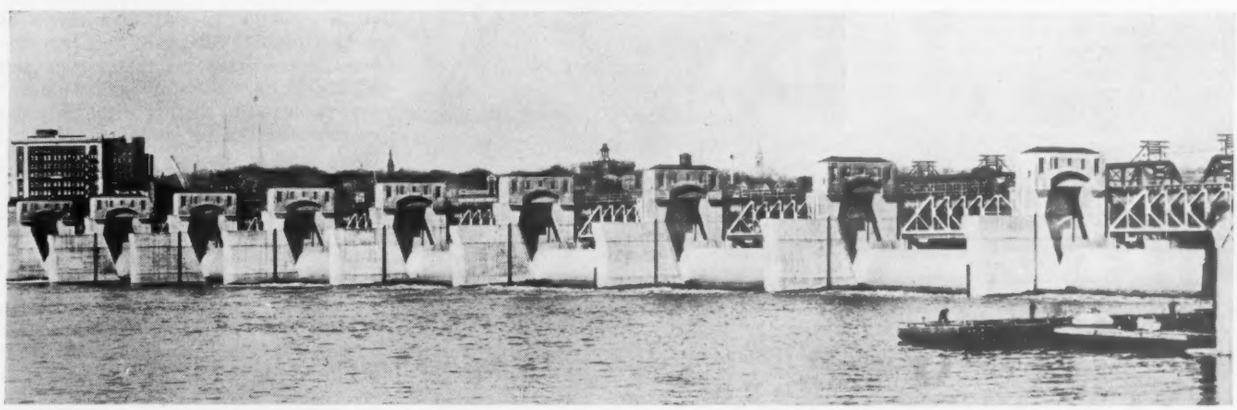
The San Francisco-Oakland bridge, now well on the way to completion, is using 3500 tons of 3½ per cent nickel structural steel for stiffening trusses and 280 tons for anchor plates.

Mississippi River Dam Has 11 Independent 100-Foot Steel Roller Gates

FROM the standpoint of length and number of gates, the largest roller-gate type dam reported ever constructed is dam No. 15 across the Mississippi river between Davenport, Iowa, and Rock Island, Ill.

Several interesting uses of steel are involved, especially in the 11 roller gates themselves which are in the form of riveted cylinders fabricated from steel plates. The larger cylinders have a diameter of 19 feet 4 inches and the end units diameters of just over 16 feet. Each of the cylinders has been made with a permanently-attached lip or apron on the water-contact side which adds to the cylinders' damming height by from 5½ to 6½ feet.

Operation of the roller-type dam calls for exacting requirements on steel. The principle on which this type of dam unit operates is that



Well over 200 tons of 3½ per cent nickel steel bars, plates and angles was used in construction of this large roller-gate dam. A considerable amount of plain carbon steel also was required

each of the cylinders, set within concrete piers, is adjustable to the water's height. Each of the roller units itself can be operated independently of the other ten and for this function, therefore, is set in drum racks to mesh with the teeth of inclined track racks. The latter are permanently set in niches in the concrete piers.

Thus, the center nine gates have a damming height of 26 feet while the two end gates which form the sluiceways have a 22-foot variation. Although considerable carbon steel was used in this dam's construction, over 200 tons of 3½ per cent nickel steel alone was used in the rolled form of bars, plates and angles. About eight tons of rollers, also of 3½ per cent nickel steel, was used.

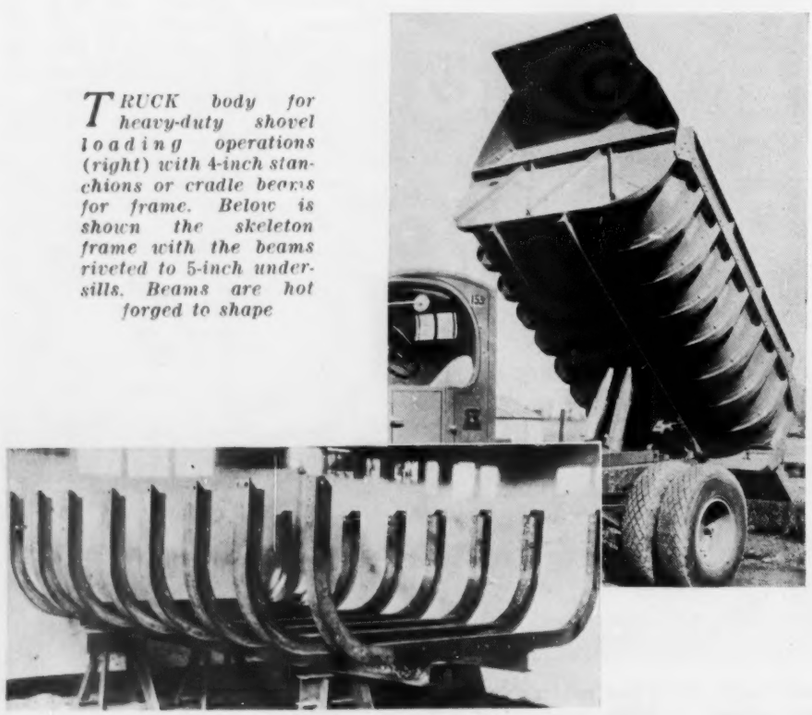
A steel service bridge extends the length of the dam, which is approximately 1300 feet, the 11 rollers each being about 109 feet long.

S. A. Healy Co., Chicago, was general contractor and all structural steel except the end sections of the roller gates was fabricated, and the roller gates, service bridges and stoplogs erected throughout by American Bridge Co., Pittsburgh. S. Morgan Smith Co., York, Pa., was general contractor for roller gates.

Heavy-Duty Truck Body Has Frame of 4-Inch Hot Forged Stanchions

STRUCTURAL shapes are usually thought of in connection with building or bridge construction. It is therefore of interest to note how the Easton Car & Construction Co., Easton, Pa., makes use of structurals in the building of heavy-duty truck bodies. An important feature in the method of construction used is the bending of the structural shapes to conform to the wide U-shaped cross section called for in the new body. Structural shapes used for this purpose are 4-inch stanchions, 10 pounds per foot, rolled by the Bethlehem Steel Co. and classed as light sections.

The Easton company for years has specialized in the construction of truck and railroad car bodies, for service in shovel loading operations. This type of service calls for a strongly built body that will withstand not only the strains of heavy loading but also the impact stresses due to the sudden dropping of large dipper loads of rock or other excavated material. In order to stand up under such heavy-duty requirements, the bodies formerly built were of unusually heavy construction and were designed especially for quarry service. In recent years, however, there has been an increasing demand among contractors on earth and rock excavation work for a body of lighter weight and yet of stronger construction than the truck bodies available. This new body is designed especially to meet the requirements desired for contract work. Accompanying illustrations show the construction of the finished body.



TRUCK body for heavy-duty shovel loading operations (right) with 4-inch stanchions or cradle beams for frame. Below is shown the skeleton frame with the beams riveted to 5-inch undersills. Beams are hot forged to shape

At present the new models are being built in capacities ranging from 6 to 15 cubic yards (heap capacities) depending on the type of operation, size of shovel, size of truck chassis, capacity of tires, and the like. It is probable that the future bodies of this type will be built to an even wider range of capacity.

When compared with the common square cross-section type of truck body it is seen that the capacity-weight ratio of the new model is considerably higher due to the elimination of the side bracing members. Such bracings always are required in square cross-section bodies employed in shovel loading operations. Moreover, as these bracing members frequently needed repairing due to their breaking or coming loose from the body, their elimination in the new model has also brought about a noteworthy decrease in maintenance cost. The curved inner surface of the new body has another advantage in that the material being hauled dumps easier from the body as there are no corners along the sides to which freezing or sticky material might cling.

Permit Economical Design

The framework for all the trucks built at the Easton plant formerly had been constructed chiefly of I-beams. As in other structural shape installations, however, the present selection of a lighter section has permitted a more economical design and a closer spacing of the members. Furthermore, the light stanchions when bent to the desired shape are ideal for use as cradle beams in truck bodies.

The 4-inch stanchions are received in full lengths. The first step in the body construction consists in forming the cradle beams to shape. This requires the forging of 90-degree curved bends in the stanchions.

These bends are hot forged by machinery using special dies made of welded plate. To insure accuracy the bend is made separately for each end of the beam. Special "snake-blocks" are employed to maintain the original cross-section shape while the bending operations are being performed.

Holes for all riveting requirements are next punched and the cradle beams are then ready for riveting to the two undersill beams. Bethlehem 5-inch, 18.9-pound stanchions are used for the undersills. The outer rib construction is thus made up of light section stanchions with the exception of the front cradle beam which is a special car channel.

The curved body plates next are riveted to the cradle beams. A "sand-

wich" type floor consisting of a 2-inch layer of oak covered with heavy liner plates then is installed over the body plates.

Other features in the body construction are the tail gate and protective plate construction over the cab. The tail gate drops automatically when the body is elevated for dumping, and closes when the body is lowered again. The body front-end plate is extended upward and outward to protect the cab and driver during loading.

This type of body has only been on the market for a little over a year but the following service account is an example of the high degree of satisfaction it has given its users. The particular truck on which a record was kept was in actual service for a year, being employed on double and triple shifts amounting to over two years of ordinary service. A 4-yard power shovel was employed for the excavating and loading operations. Measurements between opposite ends of all the cradle beams taken at the beginning and at the end of this period of time were found to be exactly the same, thus showing that the beams had not sprung in the least.

Statistics of Metals in Single Handy Volume

Metal Statistics, cloth, 560 pages, 4 x 6 inches; published by American Metal Market, New York; supplied by STEEL, Cleveland,, for $2, plus 15 cents for postage; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London.

The twenty-eighth annual issue of this publication is uniform with previous issues in form and treatment, covering production, consumption, imports, exports, stock prices and other information on ferrous and nonferrous products and raw materials.

A series of tables expanded from previous issues covers various economic subjects, foreign commerce, industrial production building, railways, car loadings, automobiles, commodity indexes, domestic and foreign money rates and other matters.

Manual Teaches Welding By Electric Arc Process

Arc Welding, fabrikoid, 94 pages, 5½ x 8 inches; published by Hobart Bros., Troy, O.; supplied by STEEL, Cleveland, for $1, plus 15 cents for postage; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London.

This is the second edition of a manual and operator's training course in arc welding, brought up to date, to include the latest in technique of this growing branch of industry. The text is nontechnical, useful to the beginner as well as to the experienced operator or technician.

Actions and Reactions

IN THE WELDING FIELD

BY ROBERT E. KINKEAD

Racket

GOOD welding operators, foremen, superintendents, engineers and salesmen are well paid. This is the result of the fact that there are not enough good ones to meet the demand. Manufacturers are simply deluding themselves if they think they can save money by hiring a man in the welding business because he is cheap. This usually results in incompetent service which is ghastly expensive in the welding business.

In five or ten years, there will be more good welding men than jobs, and they will not be paid so well. At about this time, someone will think of the bright idea of forming a union to keep wages and salaries up. Of course, that will not help because if the pay were kept up, everyone would get into the welding business and there would be no one left to make the metal on which welding operations must be performed.

IN THIS column, the author, well-known consulting engineer in welding, is given wide latitude in presenting his views. They do not necessarily coincide with those of the editors of STEEL.

It seems to us this fundamental difficulty is what keeps the organized labor movement always just one step removed from being a racket. Employe organizations operating from within are tremendously powerful in correcting obvious injustice. They are powerless where there is no serious injustice. But no one has ever discovered a successful method of keeping the price up when the supply of anything exceeds the demand for it.

Unexpected Expenditures

Most conclusive of all answers to the question, "Can this metal be welded successfully," is the accelerated life test. Granted the limitations of accelerated life testing, no other method of testing yields a result which has anything more than an inferential bearing on the question.

Nothing lasts forever. Parts, particularly those made of metal, are subject to degenerative effects such as repeated loading, corrosion, embrittlement and the like. Thermal disturbances, such as are necessary in welding, together with contour effects resulting in stress concentrations require investigation if service life is to be predicted.

Legal responsibility for service life extends only to the end of the guarantee period. Actually, responsibility for premature failure in terms of expected service life is forced on the vendor by the purchaser under penalty of not receiving additional orders. Thus, some knowledge of service life is required to prevent dissipation of working capital on "good will" account. Accelerated service life testing is often a good insurance investment against unexpected expenditures from this account.

Short Shorts

If you knew all about welding yesterday, there is a little job to be done today in checking up or you will be behind the times. There are eleven separate and distinct welding processes—all improving rapidly.

* * *

In the welding business, the heavy selling is never done by salesmen. They are all vice presidents, directors of research, welding specialists and other important titles. The customers seem to like it that way.

* * *

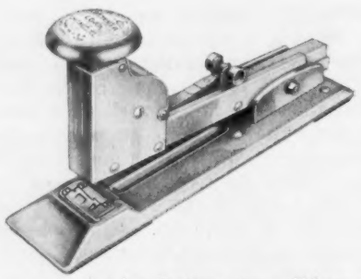
The electric power cost of any kind of electric welding is comparable in amount to the money spent for postage in selling the product if it is standardized and made in quantity.

LARGE USES OF STEEL IN SMALL WAYS

284th Article ◆ Stapling Machines

ONE of the most useful of business office accessories, stapling machines during recent years also have become a small but relatively important outlet for flat-rolled steel products. Stapling machines are used for a number of different purposes, such as the sealing of bags, fastening paper to boards or signs, and tacking labels to boxes, but by far the larger portion of these units are employed to fasten together sheets of business correspondence or other papers.

This equipment performs the same function as does the attaching of the common paper clip, except that the operation is accomplished more quickly, the staple is less bulky and the stitching is more permanent. Some machines, however, have an optional attachment which, when only a temporary binding is desired, insert an unclinched staple. The latter, resembling a common pin, is easily withdrawn. To operate a stapling machine it is necessary only to place between the head and the base the material to be bound and to press down the plunger. The staple is driven through the paper and clinched in the one operation.



—Ace Fastener Corp., Chicago

Stapling machines have gone all-steel, with estimates indicating about 200 tons consumed annually in their manufacture

Stapling machines formerly were made largely of die-cast parts. About five or six years ago a leading manufacturer turned to the use of pressed steel, and today the most popular make is an all-steel article. Use of steel has resulted in improved wearing quality of those moveable parts which are subjected to friction, and guarantees are longer than those formerly offered.

It is estimated that more than 200 tons of rolled steel is consumed annually in the manufacture of stapling machines and the billions of staples which are required each year for their operation.

Illustrated is one of several modern stapling machines. Practically all parts, including the base, staple magazine and head are stamped and formed from cold-rolled strip steel and riveted together. The unit weighs 1¼ pounds and loads 210 staples.

Built for Long Life

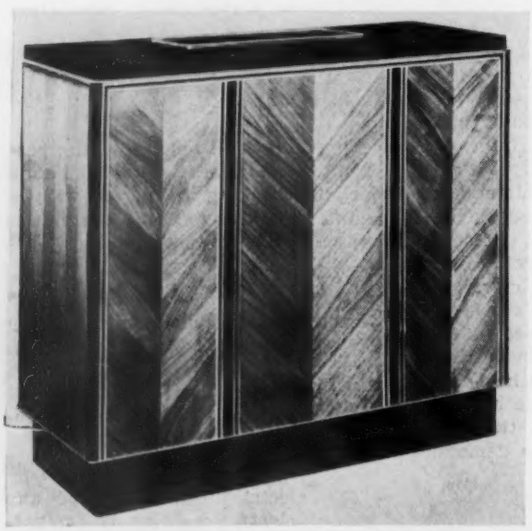
Moveable parts in the head are heat treated to resist wear. The driving blade, which forces the staple through the work, is a strip of tempered steel. Two small coil springs are located in the head to raise the plunger after each stroke, while another spring in the rear of the staple magazine, which is hinged to the base, effects the necessary clearance for the insertion and removal of the papers.

Staples are furnished U-shaped, with ¼-inch legs and ½-inch crown. These are of 0.020-inch steel stapling wire and are "frozen" together with a solution which prevents rust and which permits their easy loading into the machine in strips rather than as individual staples. Tension necessary to feed the staples to the head of the machine is provided by a strip of coiled spring steel, similar to a watch spring. As the spring feeds the staples forward, it is coiled in the head of the machine. Rubber feet molded about steel inserts are attached to the bottom of the base by screws.

Rugged construction of moveable parts, made possible by the type of steel employed, minimizes danger of breakage in the elimination of clogged staples. In the event of the clogging of a defective staple, a few blows of the plunger cuts up and expels the pieces without necessitating the removal of parts of the machine. All machines are given a heavy plating of chromium.

An adjunct to the stapling machine is a staple remover. This consists of a pincer having a small claw which when closed around the clinched staple quickly opens and removes. It is stamped from cold-rolled steel strip.

Foe of Summer Heat



PORTABLE AIR CONDITIONER: Designed for single room use, this new low priced unit is a product of York Ice Machinery Corp., York, Pa. With an adjustable telescopic window duct for air intake and heat and vapor discharge, and rubber-tired ball bearing casters, the device is entirely portable. Exterior casing is genuine walnut wood panels, with chrome-plated trim. Inner frame is of welded steel, with furniture steel panels. Duct is of galvanized sheets, spot welded and protected with black wrinkle paint. Refrigeration coils are of copper with "template" steel endplates. Framework which supports the motor-compressor unit is ⅜ x 1½-inch steel bent to form a structural element to hold the motor and compressor rigidly in a fixed relationship

Continuous Pickler Rolls Are Faced with Rubber

BY W. E. GENUNG
Roll Covering Engineer, B. F. Goodrich Rubber Co., Akron, O.

ADVANCEMENTS in pickling steel over the past 20 years, culminating in the continuous unit for processing sheet and strip, never could have been possible without the co-operation of technical staffs of several industries. Production economies, improved quality and safer working conditions are a few of the results which attest the success of these joint studies.

Whether from the viewpoint of physical equipment or refined processes, any consideration of the modern pickle line is incomplete unless attention is given rolls. A brief analysis shows the continuous process is as much dependent upon rolls as modern transportation is upon wheels.

Rolls Must Resist Acid

Those rolls used for propelling or handling dry sheet, when not in contact with destructive acid usually present a problem of construction already familiar to design engineers. However, the efficiency of the unit depends upon the use of rolls where acid is necessarily present. Specifically, acid-resistant rolls are required to carry the sheet between acid tanks, from acid to rinse tanks, to keep the material submerged in the various solutions, and in some cases to keep the sheet off the bottom of the tanks.

Among covering materials used

Fig. 1—Rubber-covered carrier roll located between acid tanks. Ventilating system is not in operation

with varying success on idler rolls are wood, stone, stoneware, carbon, and rubber. Each, of course, has a steel core or shaft. Of these, the steel core, covered with a layer of rubber on all exposed parts, appears to have structural advantages which make it more economical, durable and generally satisfactory.

Wood, because of its insufficient physical and chemical resistance, has met with little favor in large operations. Stone (granite) rolls built much like an elongated grindstone, with end assembly sheathed in lead, have been used. However, they are subject to loosening from the supporting shaft due to the excessive weight of the body in comparison to the small area of anchorage, and to breaking or spalling of the surface. Hollow stoneware rolls, with bodies of vitrified tile are said to be subject to breakage in use and during assembly. Carbon rolls are fragile and costly and have been used only under special conditions. Rubber covered steel rolls, probably used more extensively than other materials combined, offer all the strength and rigidity of a full size steel roll, plus a cushioned acid resistant surface, which may be renewed quickly when necessary.

Design of Rolls for Picklers

In general, the physical ability of rubber rolls to handle steel is known to those who are familiar with sheet and tin mill scrubbing and galvanizing operations. The design of rolls to meet the requirements of the steel industry's new development, the continuous pickling unit, should be of interest.

The success of a roll, which is to be protected uniformly with rubber over the entire exposed surface, depends to a considerable extent upon the design, material and workmanship of the core. Likewise, the measure of satisfaction derived from the roll depends upon the balance and proportioning of the core. Important elements in construction, both from the standpoint of rubber covering and service as an idler roll in continuous sheet pickling, may be enumerated as follows:

1. Steel is an ideal surface for covering, due to uniformity. Therefore, an all-steel construction, with all joints welded provides a sound foundation for application of rubber.

2. Generous diameter gives stiff-

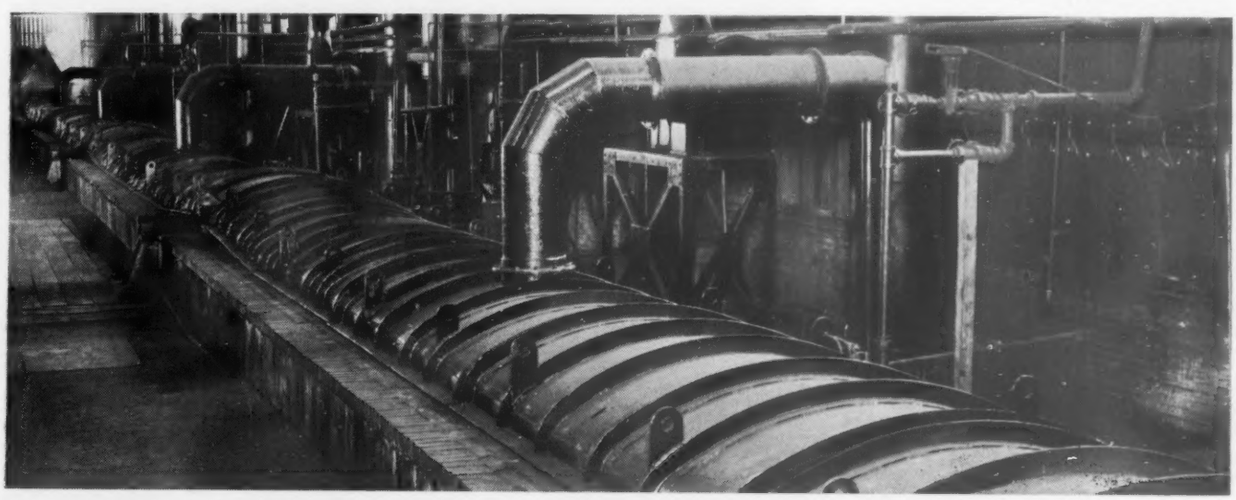


Fig. 2—View of wide continuous strip pickler. The rubber-lined ventilating system safely removes all acid fumes from the pickling room

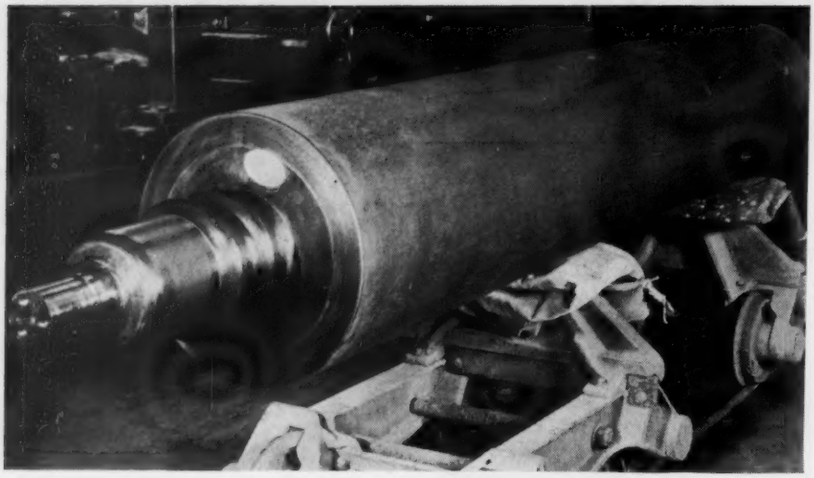


Fig. 3—Carrier roll finished with rubber on the face, ends and hubs

ness with minimum weight, and long torque arm for easier turning.

3. Elimination of excess weight by use of stub journals.

4. Transfer of vent holes in core (necessary for vulcanization of rubber) from the heads to the center of the journal to provide for unbroken covering surface.

5. Statically balanced within close limits, making a free-running roll which eliminates unnecessary drag on sheet, reducing wear on rubber surface.

A "carrier" roll core is constructed with a rolled sheet shell, and with the entire head, neck and journal assembly cast in one piece from steel. The heads are shrunk and welded in place resulting in a smooth unbroken surface ideally adapted to rubber covering. The heads and necks are hollow with all the material located where it will provide maximum strength with minimum weight. Vent holes are drilled through the center of the journals insuring complete draining from vulcanization and permitting the unbroken covering surface mentioned above.

Requirements of Rubber Covering

Having provided a suitable core, the rubber covering should meet the following requirements:

1. Acid resistance
2. Abrasion resistance
3. Resistance to laceration
4. Complete absence of cracks or leaks.
5. A bond with the metal which will isolate corrosion should a puncture occur in service.

Resistance to various acid solutions is now an accepted compounding accomplishment in the case of the usual conditions encountered in pickling. Abrasion and cutting resistance require diametrically opposite treatment in that a soft stock will abrade more slowly and a hard stock offer greater resistance to piercing. Here a medium density rubber is indicated, and the limitations now are well defined.

Prevention of leaks in the covering is a construction problem, which largely is simplified by the use of a sound core. An electrical test is employed to check the rubber cover on the face and ends for possible leakage before a roll is released for service.

Good Bond Protects Core

Realizing that punctures through accident may occur in the protective covering it is important to consider the type of bond. A direct rubber to metal bond, such as the "Vulcalock" process, will prevent seepage of acid under the rubber beyond the area of fracture. Thus, even if the roll is continued in service for a time unnoticed, the damage to the core is confined to an area small enough to repair. The method of holding the rubber to the core by the mechanical shrinkage of a hard rubber inner layer does not provide this safeguard and sometimes permits extensive damage. Particularly is this likely on the ends where a mechanical bond is practically ineffective.

Mounting the hold-down rolls on top of the tanks, so that the bearings may be clear of the acid, obviously is preferable to the use of submerged rolls. With this method of mounting, roller bearings and cheaper core material may be used. With short journals of minimum diameter a satisfactory depth usually can be reached without employing a roll of excessive diameter. However, in some operations rolls wholly submerged are desirable. In these cases cores with monel, stainless, or other suitable journals may be used with plain bearings, which also must be resistant to the particular acid.

Squeeze Rolls Rubber Covered

In addition to the several idler rolls previously discussed, it is often desirable to have a pair of squeeze rolls located at the end of the pickling operation, to remove excess water as the sheet comes from the hot water rinse tank. These rolls also are adaptable to rubber covering. The design is similar to the rolls used in scrubbing machines, except that the diameter is usually a little larger. Fig. 4 shows a pair of squeeze rolls in operation.

Many of the rubber-covered rolls installed on the earlier continuous units are still in service. It has been through the collaboration of engineers in the steel and rubber industries that numerous refinements in roll design have been made. We may now say with certainty that rubber has made a permanent contribution to the science of steel manufacture, as exemplified today by the continuous pickling line.

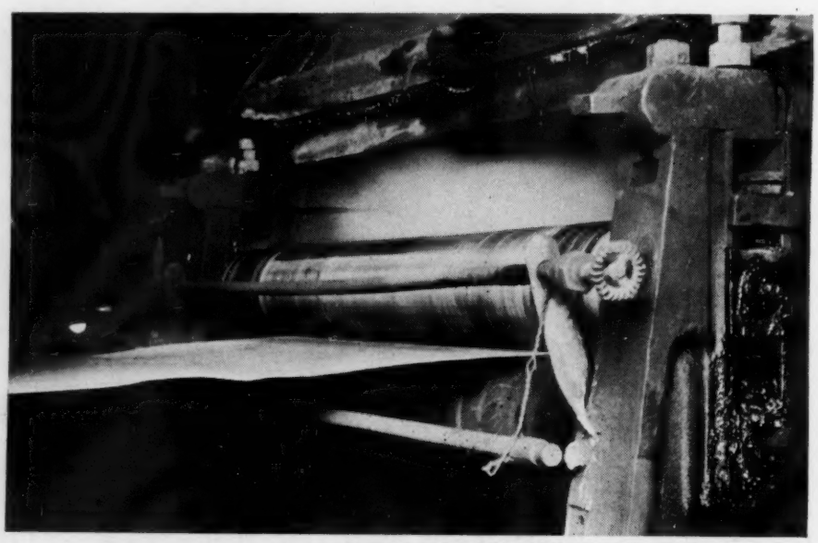


Fig. 4—Squeeze rolls located at the exit of continuous pickler

ADVERTISING PAGES REMOVED

Makes Sulphuric Acid from Spent Pickling Liquor

BY S. F. SPANGLER
Chemical Construction Corp., New York

SULPHURIC acid pickling solutions are so widely used for cleaning steel plates and shapes that steel mills and fabricators consumed approximately one-twelfth of America's production of sulphuric acid in 1934. Although the total use in the steel industries during that year was above the 1932 and 1933 requirements, it was still much less than what can reasonably be expected upon return of normal business conditions.

Sulphuric acid is therefore an important expense item in steel treatment and one in which modern economy can help the steel industry combat rising production costs and low selling prices.

In the pickling process, sulphuric acid weakens until when spent, the solution consists of a weak acid and the ferrous sulphate formed from chemical combination of the consumed acid with the steel. The spent solution has in the past been discarded as a waste by-product, because ferrous sulphate as such was hard to purify and was in little demand.

Recovery Has Been Costly

Reclamation did not justify the necessarily expensive evaporation and crystallization processes required for production in marketable quality, except in those few mills having but small quantities of the waste liquor and favored with an attractive selling outlet for the purified sulphate.

The common disposal practice for the spent liquor has been to dump into some stream or other adjacent water. Any contained value thereby became a total loss, to which had to be added the disposal expense. Steel companies willingly accepted this loss as a matter of necessity until in more recent years, authorities began to show increasing opposition to the pollution of public waters.

As ferrous sulphate and its accompanying weak acid in spent pickling solution are detrimental to plant and fish life, some neutralization process then had to be employed before legal disposal could be effected, especially where the dumping of acid liquors is forbidden. Conversion of the harmful ingredients in the waste liquor to nullify their effects added to the disposal expense, and produced no useful by-product to offset the added costs. As a result, disposal of the spent pickling liquor became a greater source of trouble and expense than ever.

On the other hand, the sulphur content in the spent liquor is just as good for making fresh sulphuric (pickling) acid as is sulphur obtained from other sources. Chemical engineers therefore have sought economical means both for recovery of value through conversion of the sulphur from the waste liquor into sulphuric acid, and for elimination of the costly disposal problem.

The late I. Hechenbleikner, then vice president and chief enginer of Chemical Construction Corp., developed the chemico sludge conversion process, in which decomposition of refinery acid sludge into sulphur dioxide was effected in a rotary kiln. This sludge, which is a mixture of sulphuric acid and hydrocarbons was handled so successfully that the rotary kiln suggested itself as a practical commercial means for reducing metallic sulphates. A small test plant readily proved its ability to reduce solid ferrous sulphate to iron oxide and to sulphur dioxide which was suitable for use in the contact process of acid manufacture.

The earlier experimentation proved that an almost anhydrous ferrous sulphate was necessary for satisfactory reduction. The product obtainable by direct crystallization from pickle liquor contains seven molecules of water of crystallization and the dehydration of this heptahydrate or copperas long has been considered difficult. The satisfactory decomposition of solid sulphate by the rotary roaster led to consideration of the latter for dehydrating the copperas with simultaneous neutralization of the free acid. By neutralizing the free acid with some of the iron oxide produced in later reduction of the dehydrated sulphate, neutralization and dehydration of the liquor in a single rotary roaster, internally heated by combustion gases, was proved to be a safe and practical procedure. Although spent pickling liquor ordinarily will not react with iron oxide cinders, a reaction causing complete neutralization of the free acid was found to be assured under the controlled temperature and concentration conditions within a special type of rotary dehydrator.

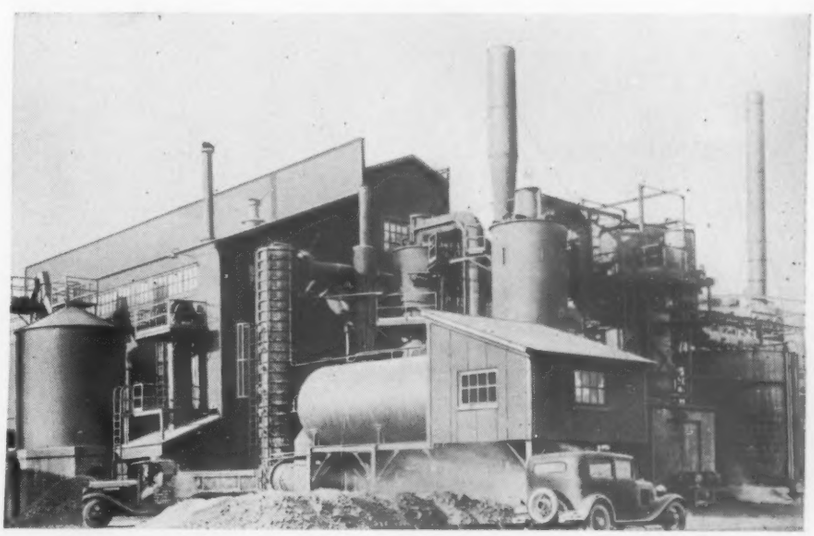
Outline of Process

On the basis of these demonstrations, the Chemical Construction Corp. in 1932 commenced to offer plants for making sulphuric acid from waste iron sulphate solutions by a process employing the following steps:

1. Neutralization and evaporation of the sulphate solution in a rotary dehydrator, using iron oxide for neutralization of the free acid, and producing an almost anhydrous iron sulphate.

2. Decomposition of the anhydrous iron sulphate in a rotary roaster, producing (a) sulphur dioxide gas of proper concentration for subsequent use in a contact acid production plant, and (b) iron oxide cinder, of which part could be ultized for neutralization of additional sulphate solution.

3. Conversion of the sulphur di-



Plant of Titanium Pigment Co., St. Louis, for converting waste ferrous sulphate into contact sulphuric acid

oxide into sulphuric acid of any desired strength, in a modified form of the standard chemico contact acid production plant using vanadium catalyst.

The reduced business activity during 1932 and subsequent years has retarded commercial installation of the process in the steel industries, but it has been applied successfully in another industry which has been operating at high capacity and producing waste iron sulphate solutions in large quantities.

The industry in question is the manufacture of titanium dioxide for use as a paint pigment. Production in this instance involves sulphuric acid treatment of ores containing iron and titanium, and forms a waste liquor containing 18 to 25 per cent of free H_2SO_4; 10 to 16 per cent of $FeSO_4$, and traces of titanium sulphate. Although these relative quantities of free acid and iron sulphate differ somewhat from the ratio commonly found in spent liquor from steel pickling tanks, reclamation from the waste titanium liquor proved similar and susceptible to the same general procedure.

Two Plants Constructed

Conclusive experimental demonstration and definite guarantees as to equipment performance led the Titanium Pigment Co. Inc. to authorize the construction of a first large commercial ferrous sulphate conversion plant at St. Louis. This plant, from which the illustrations were made, was completed in 1934. A second and larger sulphate conversion plant now is being built at its new pigment factory at Sayreville, N. J., and will be ready for operation before this summer.

The St. Louis plant houses most of its equipment in two large steel framed buildings. One contains the dehydrator kiln, two rotary roasters and accessories, and space for duplication of equipment in case of plant enlargement. The other contains the main acid production equipment, including catalytic converters, heat exchangers, centrifugal exhausters, and a central control room. Gas washing towers, acid absorption towers, coolers and other equipment which is impervious to climatic influences are located outside, and close enough to the buildings and to each other for connection by flues and piping of minimum length. Overhead traveling cranes within the buildings provide for handling the heavy equipment parts.

Obviously the important economic advantages of the process to the steel industry are the elimination of disposal problems, and the economical conversion of the waste liquor into strong sulphuric acid for further pickling operations. The conversion is accomplished efficiently without escape of fumes, without waste and at substantial money saving over any form of disposal.

The dehydrated sulphate is converted by much the same contact method as is used in sulphuric acid production from pyrites ore except that a heating and reducing agent is required. Cheap pulverized coal is excellent for this purpose, but pyrites can be mixed with the dehydrated sulphate for the double purpose of producing additional sulphur dioxide and utilizing the heating value of the pyrites to cut down on the coal requirements. The additional sulphur dioxide produces the "make-up" acid, to replace that which is lost in the recovery cycle.

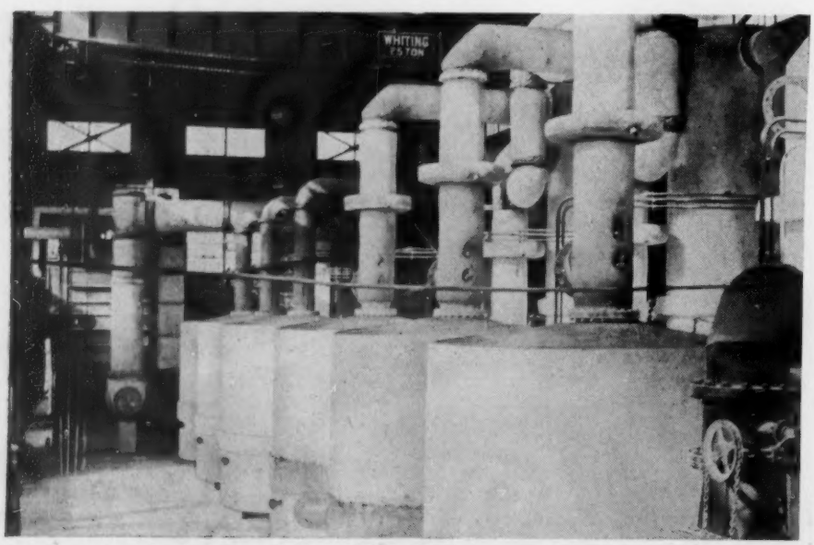
When roasting the dehydrated sulphate, the raw material cost is only that of pulverized fuel plus that of collecting and evaporating the waste pickle liquor. Due to absence of market for ferrous sulphate in large quantities, the liquor itself has no value. The cost of evaporating the liquor depends upon its degree of dilution and the availability of cheap fuel, two factors which differ for each installation. Obviously, however, the more concentrated the liquor, the less the cost of converting it before delivery to the dehydrator, and the lower the acid production costs.

Iron Oxide Sintered

The excess iron oxide formed as the by-product in the rotary roaster can be sintered cheaply to produce ore which either may be charged into the blast furnace for utilization of its metallic and oxygen contents, or may be marketed as a red pigment. Either procedure reduces the net cost of acid production, and spent pickling liquors of normal concentration can be used to produce sulphuric acid more cheaply than can any other raw material available to mills.

Acid production being necessarily continuous and largely semiautomatic with mechanically handled materials, large plants are cheaper than small and are cheaper to operate per unit of capacity. However, the process also may be profitably utilized to solve the disposal problems of a group of small producers of spent pickling liquors, by dehydrating the sulphate in small scattered plants, and roasting the sulphate in a single centrally located acid plant.

The chemico process of ferrous sulphate conversion employs numerous basic features already covered by United States and foreign patents, and other features on which patents are pending. The patents for all essential equipment features belong to the Chemical Construction Corp., New York, or are under its control through affiliated companies.



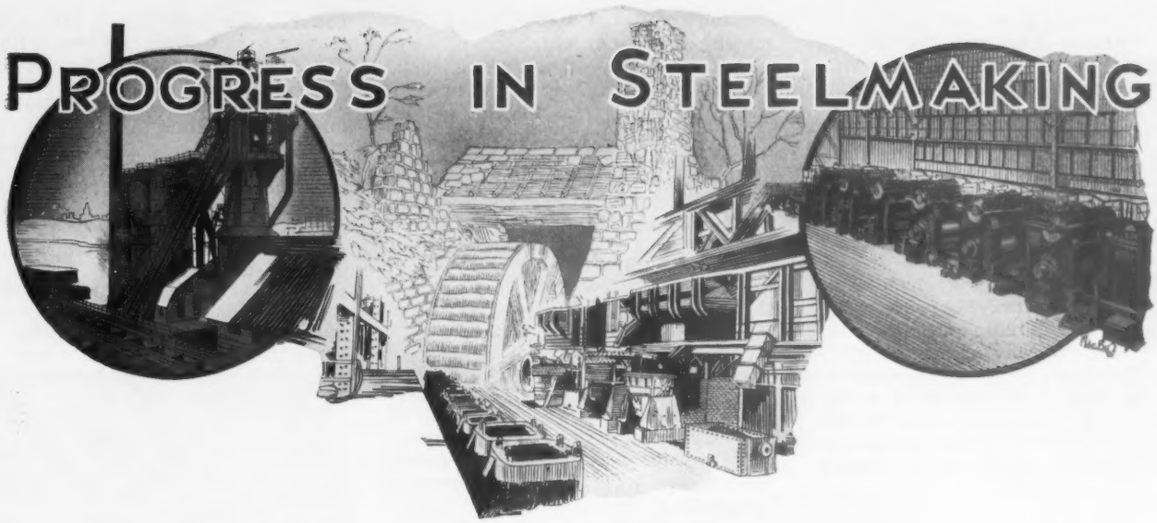
Interior of contact acid plant of Titanium Pigment Co., showing converters which employ vanadium catalyst

Butane-Propane Gases In Industrial Uses

Handbook of Butane-Propane Gas, second edition, cloth, 400 pages, 9 x 12 inches; 122 tables, 223 illustrations; published by *Western Gas*, Los Angeles; supplied by STEEL, Cleveland, for $5, plus 15 cents for postage; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London.

This volume is designed to treat every major phase of the liquid petroleum gas industry, physical characteristics of the gases, manufacture, storage, transportation and important fields of utilization.

Engineering data are presented, properties of butane-propane mixtures and relation of their properties to temperature are discussed as are volume correction factors for liquefied petroleum gases.



Decreases Mill Shutdowns

Rail mill guides treated with nonferrous hard facing material have shown a performance ratio of 50 to 1 over untreated guides. This has resulted in remarkable savings because of freedom from shutdowns for changing guides.

♦ ♦ ♦

New Method Is Effective

A blast furnace superintendent who installed checkers and graduated inserts in an old stove shell has developed a new method for insulating stoves. This is accomplished by drilling four 2-inch holes through the brick shell around the inside periphery at each brick scaffold and blowing insulating material in between the old brick wall and steel shell, under pressure. Tests on this stove disclose the method to be practical as well as effective.

♦ ♦ ♦

Treatment Aids Adhesion

Cleaned steel surfaces may be treated so that paints or other finishes will cling to the surfaces tenaciously. The cleaning solution is dissolved in water contained in a stainless steel tank, heated with coils to a temperature ranging from 170 to 180 degrees Fahr. Two rinse tanks also are required, one for cold water which overflows freely and the other for hot water. Steel free from oil and rust first is immersed in the heated solution and then rinsed first in cold water and finally in the hot water to hasten drying of the surface. The powdery residue left on the surface after drying is removed by a tack rag wipe, after which the treated surface is ready to receive the paint primer. Approximately 100 square feet of surface can be treated at a cost of ten cents.

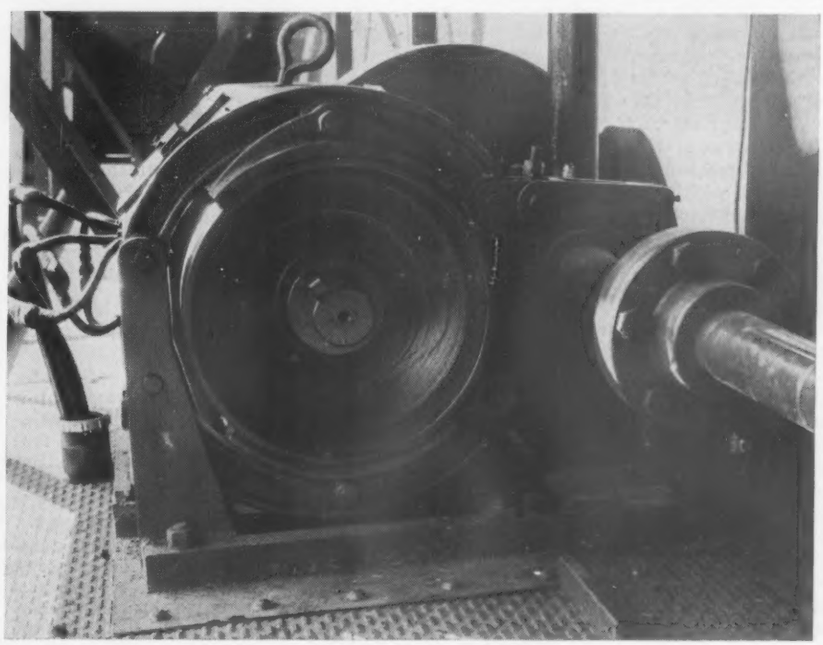
♦ ♦ ♦

Keeps Rolls in Alignment

Holding both the top and bottom rolls in the last two horizontal stands of a bar mill against longitudinal movement to obtain close tolerance rounds is accomplished by newly developed thrust bearings. These are designed with an accurate micrometer end adjustment. After the rolls are installed in the desired operating position, the bearing setting is locked in this position, thus preventing any end shifting of rolls as a factor in diametrical measurement of the rounds, except the predetermined clearance in the thrust

Uniform Pressure Is Applied

HYDRAULIC BRAKE FOR BRIDGE CRANE MOTORS—Application of antifriction bearings to cranes has been followed by the development of an external hydraulic brake to fit any make of motor. A unit applied to an 85-horsepower bridge motor is shown below. The brake is mounted on a welded base to which the uprights for carrying the shoes are welded. Operating levers and shoes are carried on hardened steel pins and bushings, with provisions for lubrication. The lining is of molded construction ground to exact diameter. The master cylinder and that for operating the brake shoes are Lockheed parts. A small storage tank is provided in the highest point of oil line for an emergency oil supply in case of leakage. The brake was developed by the Morgan Engineering Co., Alliance, O.



bearing itself. A set of these bearings recently was installed on the finishing stand of an Ohio bar mill and tolerances on the initial rolling schedule averaged from plus 0.005 to 0.007-inch on rounds ranging from 13/16 to 15/16-inch diameter.

• • •

Pickling Time Is Reduced

Pickling or cleaning drop forgings by the electrolytic process has received considerable attention recently and the time of removing the scale has been reduced as much as 50 per cent according to a metallurgist at an Ohio forge plant. Bright dips producing a silvery appearance show surface imperfections plainly.

• • •

Brake Facilitates Handling

Trucking heavy and awkward commodities in the store rooms of iron and steel plants is facilitated by the development of a safety brake. The device consists of a pair of brake shoes equipped with regulation lining and connected with a heavy telescoping cross-rod, which permits attaching the brake to any hand truck. The attachment permits the trucker to use both hands and his full weight to "break" the load, eliminating the helper, and holding the truck locked to the floor, so that it cannot move until the load is broken and the brake released.

• • •

Employs Nonspalling Brick

Vitrified paving bricks have been used extensively on coke plant wharfs but they crack and spall to a considerable degree. Within recent years several coke plants have paved their coke wharfs with a special nonspalling fire clay paving brick, 9 x 4½ x 3 inches. Although these bricks are extremely dense and highly resistant to abrasive, their elasticity and thermal expansion is such that they do not spall when hot coke slides over them. This type brick also is used in the floors of annealing ovens in malleable iron foundries with satisfactory results.

High-Frequency Induction Furnace Gives Close Control in Melting Special Alloys

By EDWIN F. CONE

AN industry which has become highly important in recent years is the manufacture of special alloys for electrical, chemical, radio and other purposes. Owing to the fact that the fabrication of alloys for special purposes requires considerable technical skill and experience, few companies are engaged in manufacturing special alloys, exclusively. The Driver-Harris Co., Harrison, N. J., specializes in nickel-chromium alloys of varying analyses which are used in many types of electrical heating equipment and in the chemical industry. The company manufactures other types of alloys, such as chrome-iron and copper-nickel.

In the production of these special alloys, uniform quality and metal cost are prime factors. Because of the highly technical purposes for which the alloys are used and because of the many manufacturing steps necessary in their fabrication, a high degree of uniformity must be exercised over the physical and chemical characteristics.

The fact that a high quality metal is essential is understood easily when it is known that some of these alloys are drawn to wire finer than a hair. For example, nichrome wire is produced with diameter of from ¼-inch to 0.0009-inch. Castings are produced of nichrome and other special alloys weighing as much as 7000 pounds each.

Two types of melting equipment are used, both the arc and high-frequency induction furnaces. There are two arc furnaces of the heroult type, each of 3-ton capacity. These arc furnaces are used generally for copper-nickel heats. For the nickel-chromium alloys, two 1000-pound Ajax-Northrup high-frequency furnaces are used.

Affords Close Regulation

Some advantages of the high frequency furnace are briefly as follows:

1. In the manufacture of many special alloys, the maintenance of a low-carbon content is essential. Because of the nature of the high-frequency operation, a close regulation of low percentages of carbon is assured.

2. In the manufacture of 18-8 chrome-nickel alloy it has been demonstrated satisfactorily that scrap can be remelted in these furnaces without any increase in the carbon content, and it has been found possible to remelt with a carbon content of 0.06 to 0.08 per cent without any substantial change in the carbon content.

3. It has been found practicable to duplicate in composition one heat after another. With an average yield it is thus possible to maintain an almost perfectly balanced output with no discrepancies and no accumulations.

4. With the use of these high-frequency units, smaller heats are possible. The flexibility which is thus possible is a decided advantage and tends to keep down the inventory.

5. Pointed to as an important asset is the fact that not so much equipment in ingot molds is necessary with these furnaces. In taking care of the output of a 3-ton furnace about 42 ingot molds are necessary, whereas 6 molds will take care of two 1000-pound induction furnaces.

6. Frequently, the furnace can be used for pouring direct into molds, cutting down decidedly the expense involved in the use of ladles.

7. The use of special rare metals often is involved in alloy production. The high-frequency furnace can be used to make precision alloys, demanded for highly specialized products which carry certain elements which will not go into true solution or which are readily oxidized

8. In operating the high-frequency furnace the power factor is high, the load is uniform and there is no penalty for day-time operation, as there are no high peaks and the load is steady.

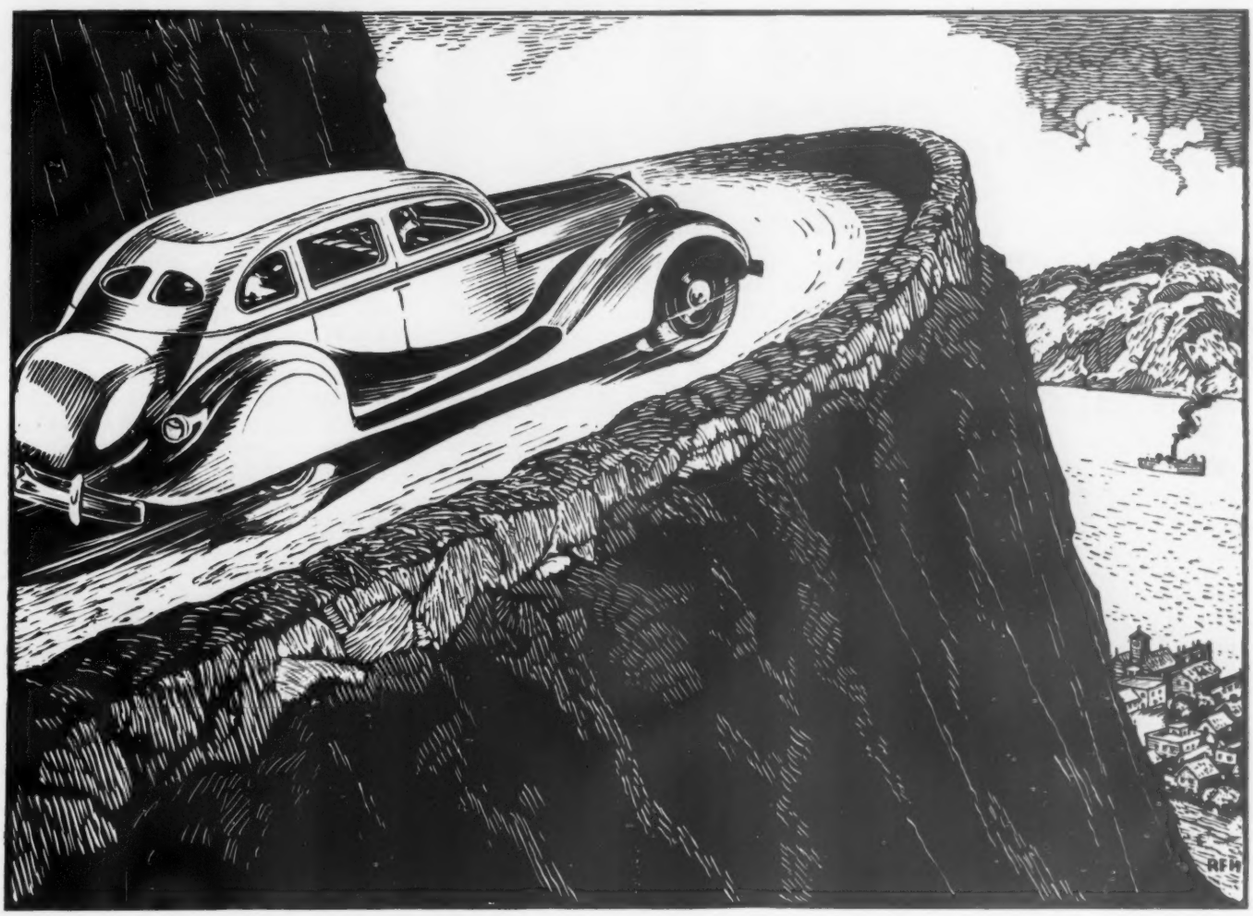
Meeting on High-Test Cast Iron at Michigan School

A symposium on high-test cast iron is to be held at Michigan State College of Agriculture and Applied Science, East Lansing, Mich., May 9-11, under joint auspices of the college, the American Foundrymen's association and the Detroit Foundrymen's association. The tentative program lists the following papers:

"Fundamental Aspects of Cast Iron," by W. H. Spencer, Sealed Power Corp., Muskegon, Mich.
"Superheating Cast Iron," by F. G. Sefing and M. F. Suris, Michigan State college, East Lansing, Mich.
"Alloy Cast Irons," by E. K. Smith, Electro Metallurgical Co., Chicago.
"Spectroscopy," by Dr. E. J. Martin, General Motors Research Laboratory, Detroit.
"Practical Aspects of Founding High-Test Cast Iron," by W. R. Jennings, Ecorse Foundry Co., Ecorse, Mich.
"Heat Treating Cast Iron," by H. Bornstein, Deere & Co., Moline, Ill.
"Mechanics of Cast Iron," by J. W. Bolton, Lunkenheimer Co., Cincinnati.
"The Foundry of 1950," by F. J. Walls, International Nickel Co. Inc., New York.

A banquet will be served on Friday evening, May 10. Arrangements for the meeting are under the direction of Prof. F. G. Sefing, mechanical engineering department, Michigan State college.

DEPENDABILITY

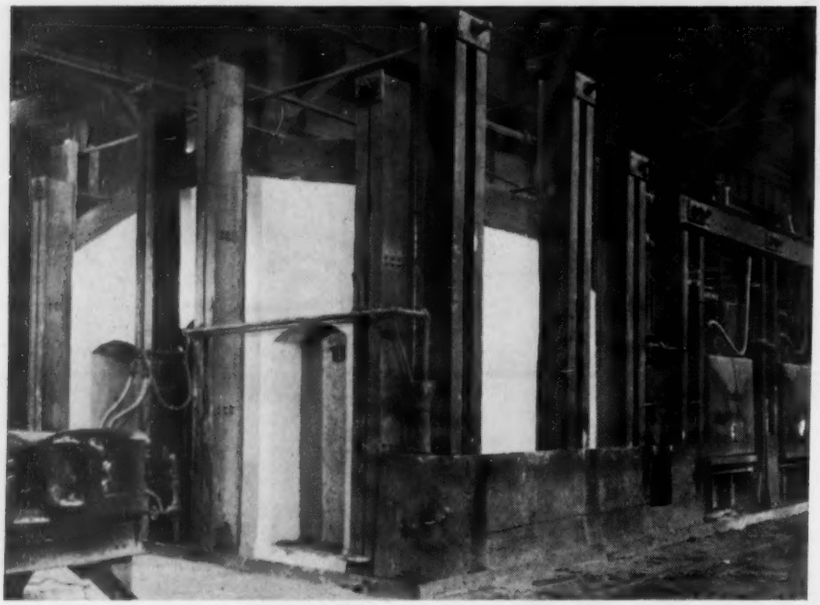


SINCE the inception of the automotive industry, millions of Nickel Alloy Steel parts have been used by prominent manufacturers of motor cars, trucks and busses. Their service records are eloquent testimony to the dependable service these steels render.

NICKEL ALLOY STEELS

THE INTERNATIONAL NICKEL COMPANY, INC.

67 WALL STREET, NEW YORK, N. Y.



Oil-fired open-hearth furnace at the plant of the Timken Steel & Tube Co., Canton, O., insulated with plastic material

Insulation of Open Hearths Reduces Time of Heats

BY GILBERT SOLER and EDWARD E. CALLINAN

USE of open-hearth insulation has been spreading rapidly, and many steel plants are operating insulated furnaces advantageously. However, successful insulation is not solely dependent on the application of a barrier of insulating material. Other factors also must be considered, such as type of insulation, furnace design, type of fuel, flame and draft control, furnace practice, and the human element.

Many insulating materials are available, but the most economical and satisfactory insulation project will be realized when the material is selected not only according to its properties but also according to the conditions to which it will be subjected.

Savings Are Afforded

Fuel savings of from 5 to 15 per cent can be realized from completely insulated open-hearth furnaces. Heat losses due to conduction through the refractories and the infiltration of cold air and its tendency to reduce checker efficiency can be lessened materially.

With insulation greater refractory life is obtained, especially with silica brick. Less spalling is likely to occur due not only to a decrease in heat shock but also to the maintenance of a more uniform temperature throughout the brick, resulting in a lower differential expansion.

Time of heat from tap to tap can be reduced as much as 4 per cent due to faster melting and less chilling effect from tap to charge. This saving in furnace time reflects in greater tonnage, lowered refractory cost per ton, and higher yield. Other advantages may result from insulation, such as decreased slag pocket deposits, better combustion control and cleaner tapping.

VARIOUS factors worthy of careful consideration in the insulation of open-hearth furnaces are presented herewith. The authors, Gilbert Soler and Edward E. Callinan, are manager of research and refractories engineer, respectively, Timken Steel & Tube Co., Canton, O.

Heat losses from regenerator chambers, flues and fantail arches amount to about 20 per cent of the total heat loss from the furnace. On original installations, insulating brick ordinarily are used in these locations, while on old furnaces a plastic or granular type of insulation may be applied more economically.

Insulating material for regenerator chambers and fantail arches should not disintegrate, fuse, or flux with firebrick at 1500 degrees Fahr. Its heat conductivity should be low, and it should have a low shrinkage in order to prevent cracking or opening up of joints. The roofs, walls and bulkheads of regenerator chambers should be insulated tightly to prevent losses by heat conduction and cold air infiltration. Usually 4½ inches of good insulation is satisfactory.

Plastic Type Applied Easily

Heat losses from slag pockets, uptakes and downtakes amount to approximately 30 per cent of the total. In general these parts have not been insulated in most original construction. When insulating old furnaces the plastic type of insulation is more easily adapted than bricks or block, and should be applied by building up layers with a hand trowel. Metal reinforcing is advantageous in tying the insulation to the vertical walls, but is not necessary if the material is properly applied. A cover coat in which portland cement or some other binder is used gives a hard, neat appearing surface. Usually 3 to 5 inches of good insulating material can be used with perfect safety. The insulating material should not disintegrate, fuse or flux with the brick on which it is applied at a temperature of 2000 degrees Fahr., all of course depending on the thickness of the walls. Insulating material should have a low heat conductivity, little or no shrinkage, and such plastic consistency that it will trowel easily and adhere well to vertical surfaces. On new construction brick or block insulation can be used successfully by making proper allowances in the design.

Above the floor level particular care must be exercised in the selection and use of insulating materials. The insulation must not fuse, disintegrate, or flux with the brick used in the roof, frontwalls, backwalls, endwalls, and bulkheads. Ordinarily from 1 to 3 inches of insulation is used, depending on the temperature which might be obtained on the cold face of the brick during any part of the campaign. The insulating material should have low heat conductivity. In selecting material, however, it is well to sacrifice low heat conductivity in favor of higher refractoriness. Here, more than in any other part of the furnace, is encountered difficulty in applying the material. This is because there is more movement taking place in the walls due to thermal expansion and contraction.

Special means for keeping the insulating material adhering tightly to the walls must be used. In the case of plastic material, metal pins, etc., tend to keep the insulation from

In the Largest Shovel in the World—

30 TONS AT A BITE

AGATHON STEELS *assure strength, toughness, dependability*

For the Midland Electric Coal Corporation, Marion Steam Shovel Company, Marion, Ohio, has built the world's largest shovel...eight stories high...almost half a block long...with a dipping capacity of twenty cubic yards. In a demonstration at Middle Grove, Illinois, the shovel scooped 30 tons of soil at a bite!

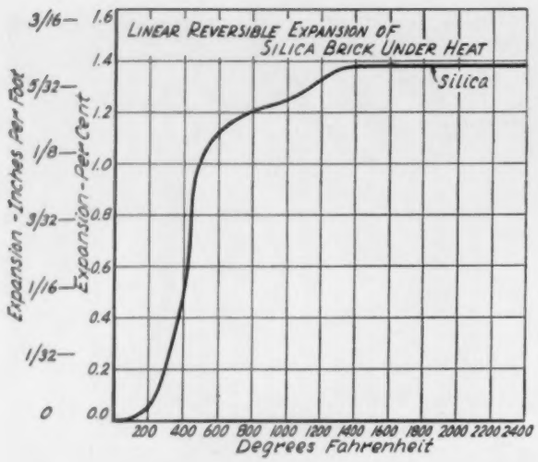
In this mammoth shovel, as in many outstanding mechanical and automotive achievements, you'll find Agathon Alloy and Carbon Steels.

Remember, Republic Metallurgists are always glad to help you design for strength, safety and unusual service.

Republic Steel CORPORATION

CENTRAL ALLOY DIVISION, MASSILLON, OHIO

GENERAL OFFICES: YOUNGSTOWN, OHIO



Linear reversible expansion of silica brick under heat

buckling and pulling away from the walls. Backup reinforcement, such as metal lath or other braces, generally tied-in to the buckstays, may also be used. Much of the insulating value is lost if an air space is formed between the wall and the insulation. The thickness of the insulation may be from 1 to 5 inches depending on the wall thickness, furnace temperature, and the refractory value of insulating material.

The amount of insulation should be regulated, not according to the wall thickness and brick-insulation interface temperature of a new furnace, but according to these factors after the wall has thinned down, frequently to less than one-half of its original thickness, after being in service. General furnace design also must be considered in the determination of the safe amount of insulation to be used. Experience has shown that on a short furnace, which is filled with flame, it is not safe to use as great a thickness as can be used on a longer type of furnace. The same will hold true in the case of a low furnace roof. In some cases it has proven economical when applying roof insulation to elevate the roof. This permits the use of more insulation and further decrease the heat losses.

Depends Upon Conditions

A properly insulated open-hearth roof will produce a relatively large proportion of the fuel savings attained on an insulated furnace, with longer refractory life, when proper flame and combustion conditions are maintained. Plastic, or granular materials covered with plastic coating, are considered the most satisfactory roof insulating materials. In general they are easier to apply, show less cracking or buckling than brick or blocks, and give a better recovery value. Not only during the heating up or cooling down period does the roof exhibit considerable movement but also during normal operations. It should be remembered that heat losses through insulating brick joints can greatly decrease the effect of insulation.

Insulation as thick as 5 inches has been used successfully on roofs. However, in general practice about 2½ to 3 inches usually is applied. Decreased roof life, which sometimes has been attributed to insulation, may be attributed more properly to furnace design and combustion control. Roof insulation has more than done its share to speed up the study of furnace design and combustion control which has been making such rapid strides in the past few years.

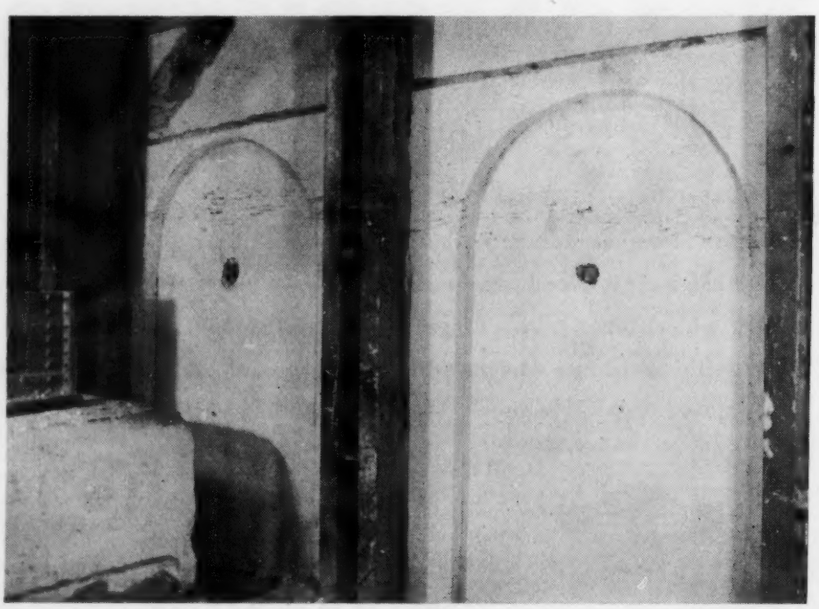
Frontwall insulation is not difficult since in almost every furnace this side is cooler than other parts due to infiltration at the doors and because in most cases the doors are water cooled.

Backwalls have been insulated successfully. Here insulation not only prevents heat loss but eliminates a considerable source of air infiltration. It also has been noted that the banks keep cleaner, the heat works more evenly, tapping is cleaner, and refractory life is not decreased. Dolomite bottoms have a lower heat conductivity than magnesite bottoms; thus the type of bottom material will have some effect on heat conduction losses.

Insulation of endwalls present no serious problems provided furnace design and combustion conditions are first studied. The flame should not be of such length that there will be excessive impingement on the wall. Furnace design affects this to the extent that if high velocities are developed as the combustion products enter the end of the furnace and turn to go down into the downtakes there will be both more violent impingement and also a greater heat transfer to the brickwork since the rate of heat transfer is increased with increasing velocity. Insulation of the endwall bulkheads may require special treatment depending on the type of refractory used. The effect of insulation on the properties of the various refractory materials is discussed later in this article.

Effects Are Important

All furnaces, which have been insulated, have not shown a decrease in fuel consumption. Since it is known that insulation will reduce the conduction losses, the cause of this condition is not to be found in the insulation itself but in the effects the insulation has produced on furnace operations in regard to temperature, fuel and air input, drafts and velocities. Unless the fuel and air input is adjusted to compensate for these changes, not only is the fuel efficiency unaffected or actually low-

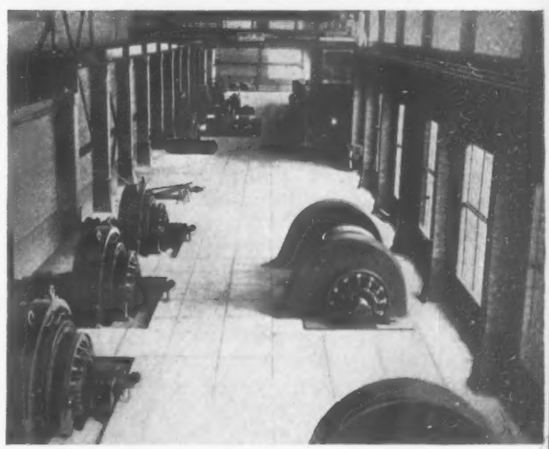


Slag pocket bulkheads of open-hearth furnaces are easily insulated with plastic insulation with a cover coat of cement

THE RECORD . . .
Wide Hot Strip Mills
Completely G-E equipped
American Rolling Mill Co., Butler, Pa. . . . . (42 in.)
Weirton Steel Co., Weirton, W. Va. . . . . (54 in.)
Republic Steel Co., Warren, Ohio . . . . . (36 in.)
Wheeling Steel Corp., Steubenville, Ohio . . (60 in.)
Great Lakes Steel Corp., Ecorse, Mich. . . . (38 in.)
Allegheny Steel Co., Brackenridge, Pa. . . . (38 in.)
Otis Steel Co., Cleveland, Ohio. . . . . (72 in.)
Illinois Steel Co., Gary, Ind. . . . . (38 in.)
Partially G-E equipped
Inland Steel Co., Indiana Harbor, Ind. . . . . (76 in.)
Youngstown Sheet & Tube Co., Youngstown, O. (79 in.)
Carnegie Steel Co., McDonald, Ohio. . . . . (42 in.)

Getting your money's worth

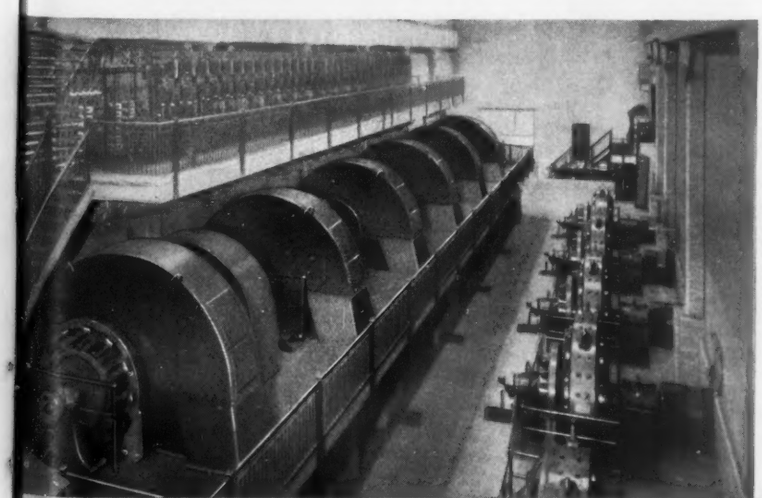
in Hot Strip Mill Drives



G-E EXPERIENCE in the manufacture and installation of wide hot strip mill drives assures you that your mill will go into operation promptly and easily.

G-E EXPERIENCE gives you a drive that permits continuous operation of your mill at high rates of production.

G-E EXPERIENCE gives you a properly balanced and co-ordinated drive, flexible and easy to operate — saving time, money, and labor.



G-E EXPERIENCE — take advantage of it by letting our steel-mill specialists, nationally recognized, assist you in selecting the proper electric equipment for your mill. Call the nearest G-E office today. General Electric, Schenectady, N. Y.

008-18H

GENERAL ELECTRIC

ered but higher temperatures may prevail and thus the safe temperature limits of the refractories may be exceeded.

Since the percentage of available heat loss by conduction is reduced by insulation, a greater percentage of the available heat is transferred to the charge, so that for the same rate of production the fuel input can be reduced. However, if the fuel input is not reduced the rate of production will be increased.

The secondary effect of insulation is to reduce the amount of infiltrating air. If a leaky furnace is insulated, infiltration is reduced. The amount of air which formerly infiltrated therefore must be pulled through the checkers. This results in a higher air temperature and consequently a higher flame temperature, providing the fuel input has not been changed.

The net effect of reducing conduction losses and air infiltration is to increase the flame temperature. This in some cases will result in exceeding the safe working temperature. Therefore, it is necessary to adjust the fuel and air input so that a safe working temperature is produced.

Heat Transfer Is Less

If the fuel and air input is reduced, and the same heat input maintained as on the furnace before insulation, the velocity of the outgoing gases will be decreased, resulting in a lower rate of heat transfer to the brick and less wear on the refractories in endwalls and downtakes. Less dust will be carried down into the slag pockets and into the checkers. The amount of combustion products will be reduced and consequently pressure in the furnace will be decreased. The stack damper then may be lowered sufficiently to produce the desired pressure in the hearth.

If the furnace can be operated at a higher flame temperature, then the fuel input can be left unchanged, and since all the air for combustion will be drawn through the checkers, it will enter at a higher temperature. A larger heat input will result. Likewise a higher flame temperature will result in a higher hearth pressure and that in turn will produce an increase in velocity of the outgoing gases. If it is desired to reduce this hearth pressure the stack damper may be raised, which will further increase the velocity. Unless the furnace is designed properly, this increased velocity will tend to increase the wear on the endwalls and downtakes, and more dust will be carried into the slag pockets and checkers. This condition can be corrected by changes in the furnace design.

Insulation does not raise the inner face temperature of any refractory but it does increase the outer face temperature in proportion to the effectiveness and amount of the insulating material used. If flame and pressure are not properly controlled in an insulated furnace the inner face temperature may be increased and the penetration of the excessive temperature developed will be greater than on an uninsulated furnace.

If excessive amounts of insulation are used at high temperatures and the outer face temperature of the refractory is brought to sufficiently high temperature the effective safe load strength of the brick may be exceeded. This varies with the type of refractory used. Magnesite, chrome, and fireclay brick may start to weaken under load at a temperature as low as 2300 degrees Fahr. Silica brick are resistant to load, however, at temperatures within 100 degrees Fahr. of their fusion point and can be insulated safely from this standpoint.

When the outer face temperature of a refractory is increased by insulation, then less difference in temperature exists between the inside and outside of the refractory, and less differential thermal stress is set up. This reduces the amount of thermal spalling.

Allotropic Changes Involved

However, spalling in silica brick is not only attributed to differential thermal expansion but also to allotropic changes occurring in the silica grains on heating or cooling. The most important inversions and the approximate linear expansion changes taking place are:

	Degrees Fahr.	Per cent expansion
α to β quartz.....	1069	0.50
α to β cristobalite..	389 to 527	1.00
α to β tridymite.....	242 to 325	0.25

A silica brick is composed of about 30 per cent quartz, the balance being cristobalite and tridymite, so that any of the above inversions may take place. The expansion changes in a silica brick are shown in the accompanying chart.

It readily can be seen that if the outside temperature of the silica brick is maintained above 1200 degrees Fahr. the troublesome inversions will be avoided and less spalling will occur in the brick.

Silica brick matures in service, that is, the quartz content gradually changes to cristobalite and tridymite. On an uninsulated brick this maturity occurs only to a shallow depth on the inner hot face. On an insulated brick, however, this matured zone extends much deeper and a more stable structure results.

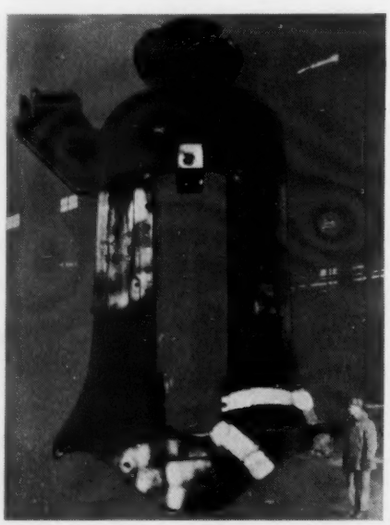
The factors outlined in this article give in a general way the problems encountered in the insulation of an open-hearth furnace. Each furnace insulation project will require special treatment depending upon the specific conditions involved. The successful solution of the problem of open-hearth insulation largely is dependent on the co-operation and training of the furnace operators. The changes in furnace operation produced by insulation should be explained to the furnace operators in their own mill language, for without their interest and co-operation no open-hearth insulation project will prove to be successful.

Plate Mill Housing Is Repaired by Welding

One of the largest thermit repairs in many years recently was completed at a mid-western steel mill. The broken part was a housing of a 160-inch plate mill as shown in the accompanying illustration. The casting, without appurtenances, weighed 164,000 pounds, stood 21 feet 8½ inches high, and was 14 feet 9 inches wide at the base and 10 feet wide at the top.

The original fracture, which caused the housing to be removed from service, occurred in the lower portion and ran from an inside corner diagonally downward through a T-shaped section, one leg of which was 38 x 12 inches and the other leg 30 x 26 inches. In preparing this fracture for welding, another crack was discovered above the first running through a section shaped roughly like an I-beam with members 26 x 8, 26½ x 8 and 30 x 15 inches.

Four tons of thermit was required to make the two welds. The entire job, from the waxing of the first fracture to the pouring of the second weld, was completed in exactly one week. Since the cost of the two welds was only a fraction of the cost of a new housing, a considerable saving was effected.



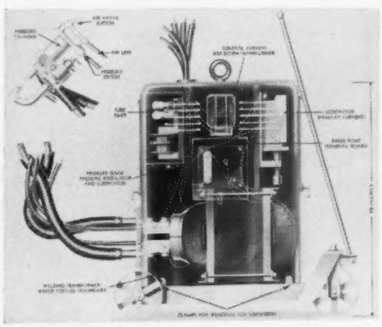
Eight-ton plate mill housing which cracked while in service. The location of the fractures is indicated by the white sections at the lower right of the housing

NEW EQUIPMENT

Mobile Gun Welder—

Thomson-Gibb Electric Welding Co., Lynn, Mass., recently developed a mobile welding machine consisting of a welding gun operated by a single push button switch, and a compact portable steel cabinet which contains all the transforming, regulating, contacting and timing apparatus. It can be used on a wide range of work and is particularly adapted to assembly line production or to work which is fabricated in jigs.

The machine is equipped with a demountable truck and a heavy lifting bolt so that it can be wheeled



Thomson-Gibb gun welder has portable transformer cabinet

to the work or suspended on a traveling hoist. All controls are conveniently located inside the cabinet. A special over-size transformer which supplies a large volume of current for short intervals and a weld timer which breaks the circuit the instant the weld is completed eliminate the need for special water or forced air cooled leads. Welds take only 1/20 to 1/3 of a second, which is too fast to heat the leads or electrodes. The standard welding gun can be fitted with a wide variety of interchangeable water-cooled yokes made of special heavy wall copper tube fitted with hard copper alloy welding tips. They are available in a number of standard shapes and special arrangements can easily be designed to suit specifications.

The gun is equipped with a built-in pressure operated limit switch that automatically applies the current when the pressure in the air cylinder reaches a pre-determined amount. It can be set to trip at any required pressure. This automatic switch and the weld timer which control the current, speed up the operation of the gun and increase the number of spots that can be produced per minute. The unit, illustrated herewith, can weld clean metal up to 16 gage and the gun can be fitted with yokes having throat depths up to 12 inches. Guns, yokes and complete transformer equipment are available for heavier work or work requiring larger throat depths.

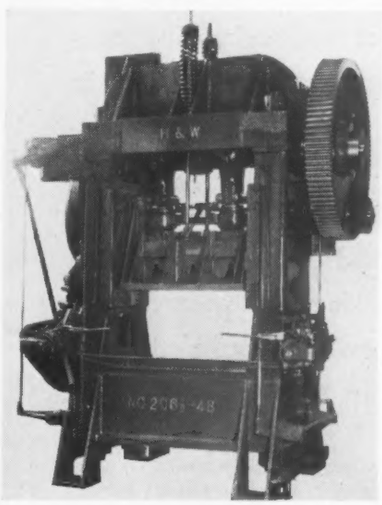
◆ ◆ ◆

Automatic Feed Presses—

Henry & Wright Mfg. Co., Hartford, Conn., recently added to its line single geared straight sided double crank welded steel presses arranged with automatic double roll feeds and scrap cutter. The unit shown herewith has a 6½-inch crankshaft at bearings and has a bolster area of 36 x 47 inches, distance between uprights being 48 inches.

The presses are of the shrunk-in tie-rod type of construction with the bed, uprights, crown and slide made of steel heat treated after welding but not before machining. The jaw clutch located in the large gear has three simultaneous driving points, each locked in place after engagement by receding plugs, thus preventing clutch knock near the bottom of the stroke.

Scrap cutter provided is of rigid



Henry & Wright single geared straight sided welded steel press

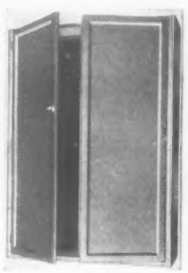
construction and of ample proportion to cut scrap into lengths equal to the feed pitch. It is driven directly from crankshaft by individual slide and pitman. Cutter is adjustable horizontally in direction of feed and also vertically to meet metal line variations and in addition, the gate is independently adjustable.

◆ ◆ ◆

Cabinet Type Steel Meter Panel—

Bailey Meter Co., 1050 Ivanhoe road, Cleveland, is offering a cabinet type steel meter panel equipped with doors to protect and conceal meter and control connections. The doors

Rear view of cabinet type meter panel developed by Bailey Meter Co.



are provided with a three-point locking mechanism and a cylinder lock.

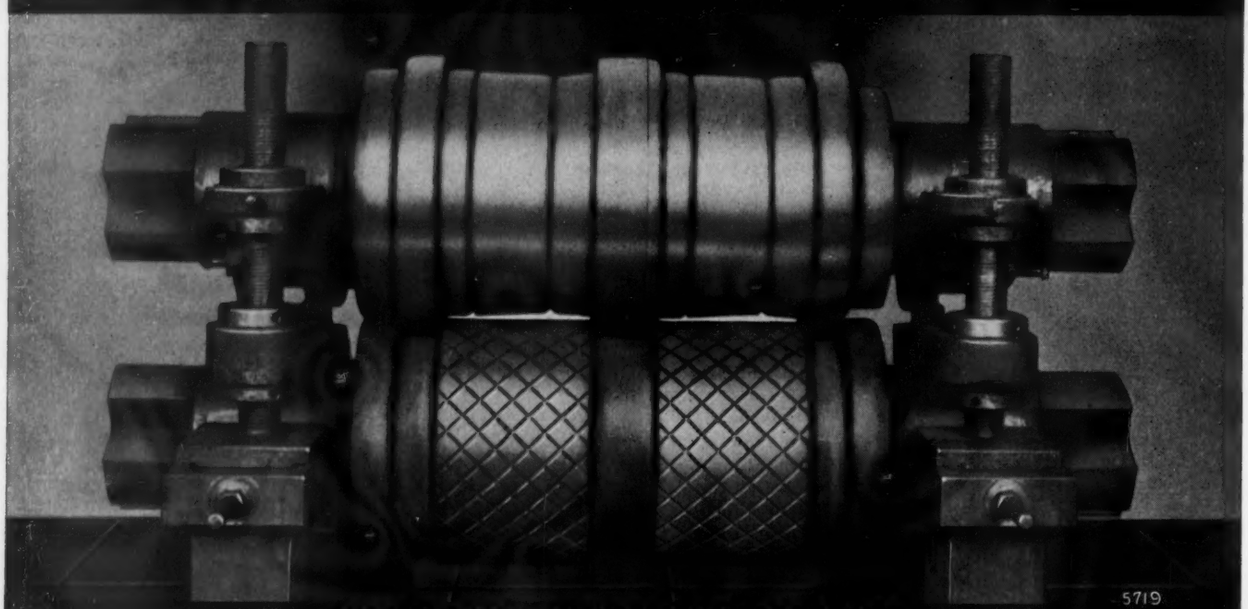
These panels, shown herewith, are made of one-piece sheet steel plate. Self-supporting construction which appreciably facilitates installation, is secured by bending the sides of the panel back to form supporting wings. Although the completed panel is self-supporting, a base flange drilled at convenient intervals provides means for securely bolting or lagging it in place. This base flange which is entirely concealed within the cabinet is formed by bending both the front and wings inward through an angle of 90 degrees. The entire panel is finished in a smooth and luxurious black tone which gives the appearance of slate.

◆ ◆ ◆

Grinders and Buffers—

Skilsaw Inc., 3310 Elston avenue, Chicago, recently announced as an addition to its line of portable electric tools a complete line of bench and pedestal grinders and combination grinder-buffers, both bench and

CUT PRODUCTION COSTS WITH UNITED ROLLS . . .



UNEFCO 24" x 48" TIE PLATE FINISHERS

UNEFCO GREEN WABBLERS—the outstanding alloy iron base rolls—offer strength much greater than any straight chill roll or any other condensed-grain roll, high resistance to wear and extremely long life, with established records of 300 to 400 percent increase in length of life. Made in three grades—hard, medium and mild.

UNITED Rolls have been developed in conjunction with the rolling mill industry to meet the most exacting requirements of structure and strength—and to provide better performance and longer life than previously obtainable. Close contact with operating conditions and the needs of the industry has resulted in a correct analysis and grade for the rolling of any section from the largest bloom to the smallest and most intricate shape.

UNITED Roll Engineers and Metallurgists will gladly recommend grade, type, size and pass design, and will co-operate in every possible way in effecting high production and economy in rolling. Write for a copy of Bulletin R-1001.

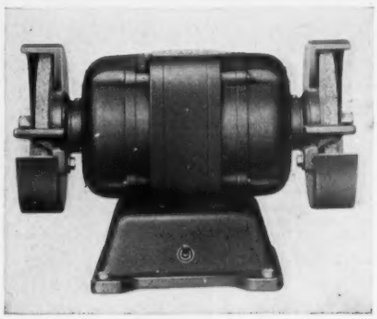
UNEFCO GREEN WABBLERS
UNITED STRAIGHT CHILL
UNITED NICKEL CHILL
UNITED MOLY. CHILL
UNITED SPECIAL SHEET
UNITED PLAIN SAND
LINCOLN SPECIAL
UNITED SPECIAL STEEL ALLOY
UNITED CARBON STEEL
UNITED ADAMITE

UNITED
ENGINEERING *and* FOUNDRY COMPANY
PITTSBURGH — PENNSYLVANIA

THE WORLD'S LARGEST MAKER OF ROLLS AND ROLLING MILL EQUIPMENT

pedestal type. The wide selection of sizes available includes units for intermittent tool shop use and for production work. Motors in the bench grinders range from 1/6 horsepower, split-phase type or condenser type in the 6-inch size, to 1½ horsepower, 220-volt, 3-phase type in the 10-inch.

Motor design, construction characteristics and performance of the line of combination grinder-buffers are identical to the bench grinders, ex-



Skilsaw bench grinder designed with totally enclosed motor

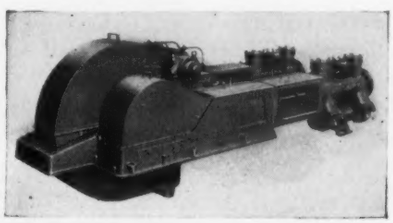
cepting that motors in these units are all condenser type. The condenser type motor offers several distinct advantages. This motor can be slowed down in speed and stalled without damage to motor. Equipment on the grinders is complete. Guards on the larger models are the enclosed type of heavy, durable metal. Tool rest on all models is adjustable for wear of wheel; and tool rest, as well as guards, can be removed for buffing.

♦ ♦ ♦

Totally-Enclosed Pump

Worthington Pump & Machinery Corp., Worthington avenue, Harrison, N. J., has brought out an 18-inch stroke totally-enclosed horizontal duplex power pump. The power end of this unit, shown herewith, is self-contained and is supported on a foundation throughout its length. Frames are cast enbloc.

An oil pump, driven by a crank from the pinion shaft, supplies oil for the flood lubrication of all bearings and the pressure spray lubrication at the intermesh of the gear and pinion. Main gear and pinion are full herringbone and may be of any ratio required up to 9.66 to 1. The totally-enclosed power end was developed



Worthington 18-inch stroke totally enclosed horizontal power pump

primarily for refinery service, but, because the moving parts are fully protected from dust and dirt, it has a wide field of usefulness in field and pipe line service for loads up to 200 horsepower. The totally-enclosed power end is designed for use with either the packed piston or outside-end-packed plunger types of liquid ends for either hot or cold liquids.

♦ ♦ ♦

Flow Meter—

Elgin Softener Corp., Elgin, Ill., is manufacturing a new type of flow meter which utilizes a varying orifice. As the flow of steam, water, oil or other liquid or gas varies, the orifice opens and closes. Movement of the orifice gate and the changing of that movement into an electrical impulse that can be registered by remotely located indicating, recording or totalizing electrical meters, has been worked out in an ingenious way as shown in the accompanying illustration.

With the pressure drop established, it is necessary only to measure the opening of the orifice. The vertical movement of the orifice gate is measured by changing the linear motion of the small stem to rotary motion. The rotary motion operates an

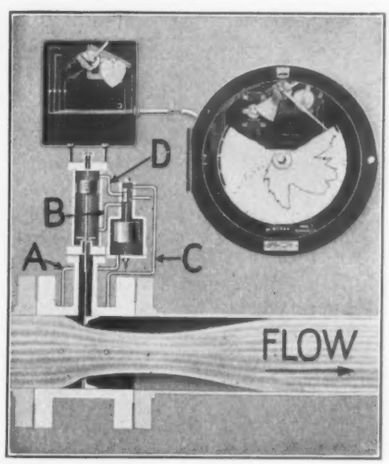


Diagram showing operation of new type Elgin flow meter

electrical time contact device. The time contact device consists of a constantly rotating cam, driven by a clock type motor.

The mechanism which receives the electrical impulses from the actuator is identical to the mechanism mounted on the actuator.

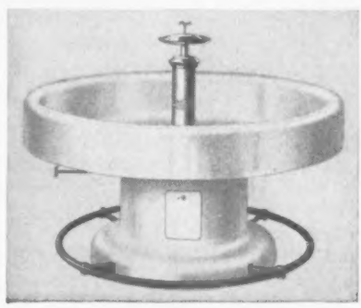
♦ ♦ ♦

Wash Fountains—

Bradley Washfountain Co., 2203 Michigan street, Milwaukee, recently announced a new line of enameled pressed iron wash fountains. These units, shown herewith, are circular in design (54 inches in diameter),

accommodate ten users at one time and are available with either hand or foot control of water flow.

Bowls are solid one-piece iron pressings, finished in acid-resisting



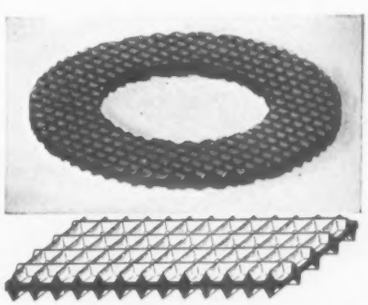
Bradley enameled pressed iron wash fountain for industrial plants

vitreous enamel and may be had with either roll rim or deep apron. Pedestals consist of pressed iron base members with electrically welded cylindrical superstructure finished in either vitreous enamel or high-bake synthetic enamel, both acid-resisting. They are pressed from deep drawing annealed stock, 10 gage, and are reinforced by a specially designed piece.

♦ ♦ ♦

Multiseal Gasket—

Goetze Gasket & Packing Co. Inc., 34 Allen avenue, New Brunswick, N. J., has introduced a new multiseal gasket. Tightness is accomplished by



Goetze multiseal gasket available in variety of materials

providing the faces with crossed ductile and resilient raised ribs, which under small bolt pressure, set themselves into the tightest contact even on imperfect flange faces, and maintain the tightness under high fluid pressure, expansion and contraction and vibration. These gaskets are more resilient than flat solid metal gaskets, is is claimed.

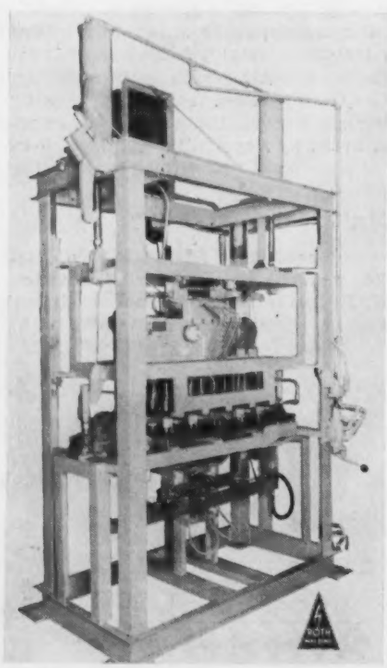
The new multiseal construction offers a simple and effective means of producing and maintaining correct surface and thickness for dependable service. These gaskets are obtainable as solid copper, steel, Armco iron, aluminum or lead, or as a metal shell with asbestos filler in any circular, elliptical or special shape.

♦ ♦ ♦

Automatic Spot Welder—

Roth Welding Engineering Co. Inc., 1163 Harper avenue, Detroit, recently placed on the market a new type of full automatic spot welding equipment. This welding method is adaptable for any welding job where a number of spot welds in various fixed locations are to be performed on steel panels.

A number of individual hydromatic welding units are mounted in a fixture in correct location (vertical, horizontal, or any angle that may be required) and a full automatic master control unit with multiple valves operates the individual hydromatic welding guns in rapid succession. Average speed is from two to five spot welds per second, but it is possible to operate the guns in such a way that two or more spot welds are performed at a time. The illustration shows a standard multi-hydromatic welding press, as it is used for welding flat panels.

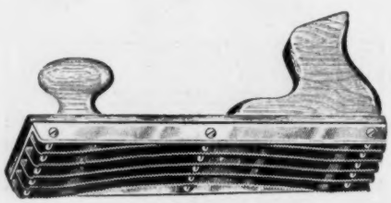


Roth multi-hydromatic welding press used for welding flat panels

♦ ♦ ♦

Hand Surfacer—

Surfacer Mfg. Co., 2452-2458 Irving Park boulevard, Chicago, recently developed a hand surfacer which is finding wide application. Resembling in appearance a carpenter's hand plane, the new tool is designed for surfacing and leveling clicker and cutting blocks used in connection with cutting dies and sharp tools. More recent applications include foundries where the surfacer, shown herewith, is employed for smoothing up aluminum, zinc and other soft metal castings. Woodworking and pattern shops are using it to remove excess glue after it has dried and hardened. The tool is 9 inches long and 2 inches wide, with five 21-gage high-speed steel with soft back and tempered cutting tooth edges.



Hand surfacer developed by Surfacer Mfg. Co. finds industrial uses

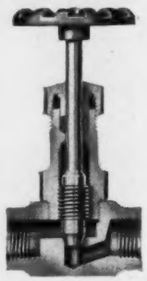
♦ ♦ ♦

Bar Stock Steel Valves—

Walworth Co., First and O streets, South Boston, Mass., is announcing a new line of valves made from bar stock and readily available in either carbon or stainless steel. They are furnished in either globe or angle type, sizes ¼ to 1 inch inclusive.

These valves, shown herewith, are designed to operate under high pressure for controlling gas, gasoline, air or any liquid or gaseous vapor. They are rated for 3000 pounds oil, water or gas working pressure at 150 degrees Fahr.; for 600 pounds at 750 degrees Fahr. The bodies of these valves have extra long tapered pipe threads, which permit clearance between the end of the pipe and diaphragm.

A deep stuffing box is provided with a gland and is of ample size to contain ample packing. Valves made of carbon steel are recommended for such service as gases and fluids which do not attack carbon steel. All carbon steel valves are cadmium plated.

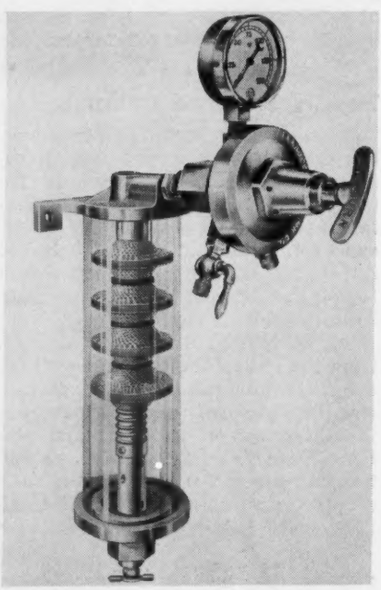


Sectional view of new Walworth valve made from bar stock and available in either carbon or stainless steel

♦ ♦ ♦

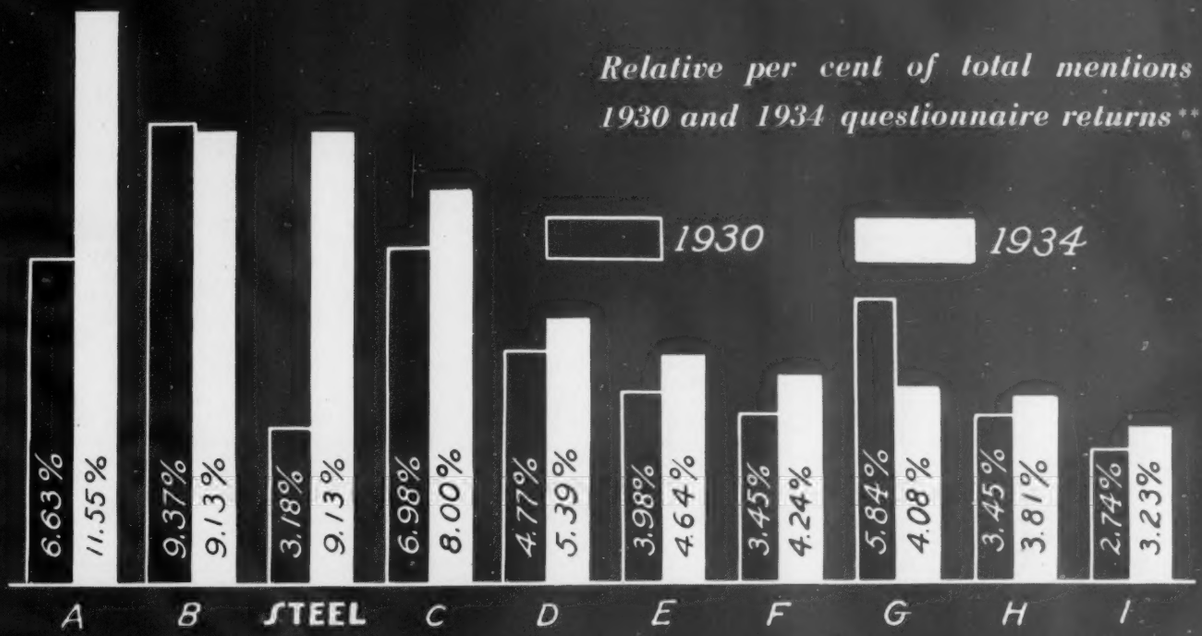
Gas and Air Purifier—

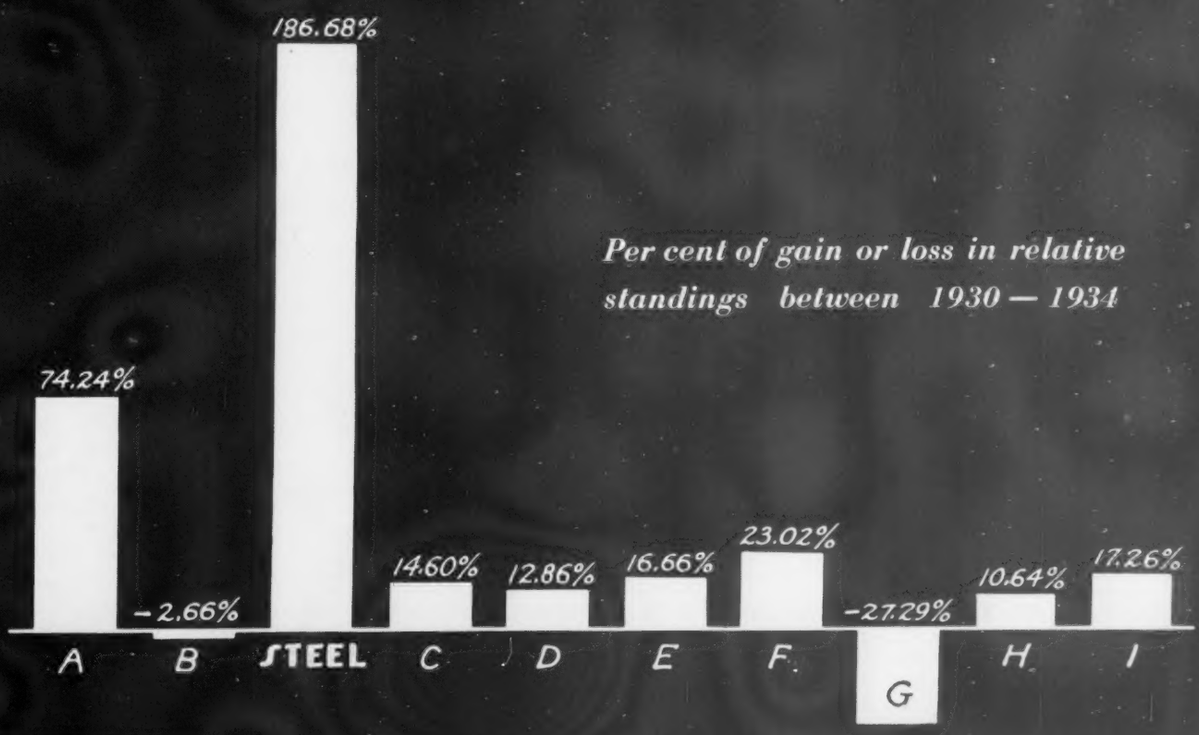
Alexander Milburn Co., 1416-1428 West Baltimore street, Baltimore, has introduced a new purifier for conditioning air or gas. The device, shown herewith, has a glass shell through which any accumulated oil, moisture or dirt can be seen readily. A series of perforated plates and strainers efficiently remove foreign substances from air or gas lines, insuring at all times a clean, moisture-free flow for paint spraying, welding or any other similar operations. It is particularly desirable for paint spray equipment where the air to the spray gun must be conditioned to prevent spotting of work.



Milburn purifier for conditioning air or gas is a compact unit

*Comparative results of two reader surveys made by a mechanical rubber goods manufacturer**





*Explanation on request

**Taking total returns on 38 publications that showed 10 or more mentions in 1930—and are represented in the 1934 returns

N. B.—Publications charted are those showing 4% or better of the total returns from the top 38 publications

Just another proof that STEEL *is the* ***fastest growing Industrial Publication***

New Trade Publications

BOILERS—Union Iron Works, Erie, Pa., has issued a bulletin on its radiant heat boilers for use of operators of boiler plants.

BASIC SLAG—Tennessee Coal, Iron & Railroad Co., Birmingham, Ala., has issued a leaflet on the value of basic slag as a farm fertilizer.

GEARS, SPROCKETS—Medart Co., St. Louis, in catalog No. 56-G, just issued, contains standard listings, weights and dimensions of gears, sprockets and chains.

GAS BURNERS—Barber Gas Burner Co., Cleveland, in bulletin No. 35 lists and describes its line of burners for various uses, accessories and auxiliaries. Tables of specifications are also included.

FASTENERS—A catalog of its line of fasteners has been issued by Edwin B. Stimpson Co., Brooklyn, N. Y., manufacturer of eyelets, grommets, hooks, snap fasteners and similar products.

BOILER BAFFLES—Plibrico Jointless Firebrick Co., Chicago, illustrates in a current bulletin its Beco-Turner baffles. Diagrams show efficiency of its features and details of construction.

LUBRICATION—In its series of bulletins on lubrication the Texas Co., New York, deals with specialty lubricants for special machinery, with illustrations covering a wide range of purposes to which they are applied.

DIESEL TRACTORS — Caterpillar Tractor Co., Peoria, Ill., has issued a 44-page catalog of its diesel forty tractor, in two colors, It presents the subject in text and with model and action pictures.

GRINDERS — Landis Tool Co., Waynesboro, Pa., has issued catalog No. E-35 on its 15-inch, type C, hydraulic grinders. It contains illustrations, descriptions, specifications and details of construction.

REFRACTORY BRICK—Charles Taylor Sons Co., Cincinnati, in a current booklet describes its refractory insulating brick. It gives complete engineering data, comparative tests and performance reports.

CRANES, HOISTS—Curtis Pneumatic Machinery Co., St. Louis, has issued two survey reports by large users of its cranes and hoists, covering long life and efficient operation. They are No. 3411 and 3501.

PYROMETERS—C. J. Tagliabue Mfg. Co., Brooklyn, N. Y., has issued a bulletin on its pyrometer indicating controllers, photoelectrically balanced, of non-hunting, non-drifting types. Illustrations and diagrams supplement the text.

TRACTOR CRANE — Silent Hoist Winch & Crane Co., Brooklyn, N. Y., has issued bulletin No. 45 on its crane car and crawler, containing illustrations showing its applications, dimension blueprints, capacity diagrams and complete description and specifications.

MOTORS—Howell Electric Motors Co., Howell, Mich., has issued bulletin No. 1120 on its red band electric motors of various types. Illustrations show the motors and details of construction, the text going into methods of winding and stator insulation.

CORROSION RESISTANCE—In its bulletin No. TS-7 International Nickel Co. Inc., New York, treats technically the resistance of nickel and monel metal to corrosion by chlorinated solvents used for dry cleaning and in other industries for removing grease and dirt.

BOLTS, NUTS—A catalog, No. 32, has been issued by the Milton Mfg. Co., Milton, Pa., on its bolts, nuts and kindred products. It covers the entire line, with instructions for ordering, terms and tables of sizes, weights, prices and other data.

BLAST NOZZLES—Norton Co., Worcester, Mass., has issued a bulletin on its Norbide pressure blast nozzles, including illustrations, tables of specifications and orifices and a statement of advantages of their use. Resistance to wear from the abrasive stream is emphasized.

HOLLOW DRILL STEEL—Bethlehem Steel Co., Bethlehem, Pa., has issued a booklet on its hollow drill steel. Illustrations show a variety of difficult uses to which it is put. Method of manufacture, testing, processing, heat treatment and general information are included.

TUBE CLEANERS—Lagonda Mfg. Co., Springfield, O., in its catalog X-16, goes into detail as to construction and operation of its tube cleaners for all kinds of tubes and pipes. It is a complete exposition of the various types designed for varied service in many industries. Ample illustrations and diagrams furnish added value.

SPEED REDUCERS—Link-Belt Co., Chicago, in catalog No. 1515 describes its new line of motorized speed reducers in which the motor is mounted directly on the side of the reducer housing, making a shaft coupling or motor base plate unnecessary. Choice of the proper reducer by use of selection tables is illustrated.

SHOVEL CRANE—American Hoist & Derrick Co., St. Paul, in a current bulletin features its model 350 gopher ½-yard shovel-crane-dragline, crawler type, for gasoline diesel or electric operation. This extends the range of these excavators from ½ to two yards. Details of construction are illustrated and tables of specifications are presented.

BERYLLIUM COPPER — American Brass Co., Waterbury, Conn., has printed a second edition of its B-21 bulletin on beryllium copper, a heat treatable alloy having exceptional physical properties. Complete information as to the material is included, with illustrations and data tables.

STOKER—In catalog No. E-8 Combustion Engineering Co. Inc., New York, features its type E, center retort, underfeed retort. Illustrations show installations, cross sections and details. Stokers now in use serve more than 11,000,000 square feet of boiler surface, burning various types of fuel.

SHAFTING—Bliss & Laughlin Inc., Harvey, Ill., has issued a bulletin, indexed for the filing case, calling attention to the quality of its shafting and small rounds, turned, drawn, ground and polished. Emphasis is placed on the precision standards maintained in its product. Tables of sizes and tolerances are included.

STEEL PLATE—In a current bulletin Lukens Steel Co., Coatesville, Pa., and its subsidiaries, By-Products Steel Corp. and Lukenweld Inc., describes the products of its large plate mill, said to be the world's largest. It is largely a picture book, illustrating the wide range of production covered by this organization.

VALVES—Parker Appliance Co., Cleveland, has issued its bulletin No. 38, covering its valves of standard types, with specifications and prices. Announcement is also made that the company is about to release 32 new dimension sheets to complete its engineering data folder formerly furnished to customers.

BAND SAWS—Saw & Knife Specialty Co. Inc., Cleveland, has issued a leaflet on its supreme brand nickel alloy steel band saws. Advantages of the alloy steel are recounted, both for wood and metal cutting. Price lists and standard points and gages are included. The leaflet also describes accessories, saw guides, files, silver solder and band saw rubbers.

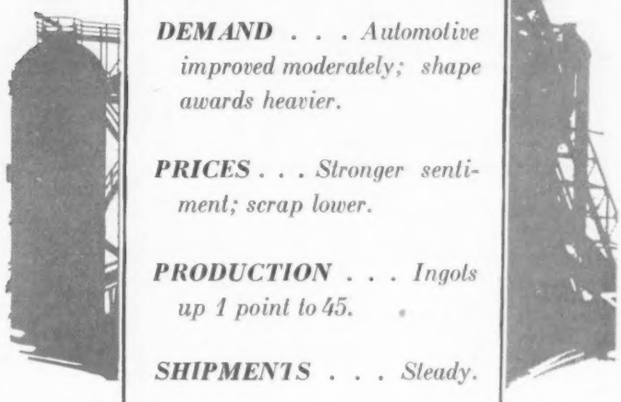
ELECTRIC CONTROL—Clark Controller Co. and Sundh Electric Co., Cleveland, have issued a loose leaf catalog, consisting of bulletins with complete descriptive and price information on standard products, with a numerical index and an alphabetical index, cross-indexed under various headings. It is a complete and excellently arranged presentation of the company's products.

TURBINES—General Electric Co., Schenectady, N. Y., has issued three bulletins dealing with turbines for mechanical drive. These include single-stage steam turbines, 40 to 400 horsepower, noncondensing; multistage steam turbine, 100 to 2000 horsepower, condensing or noncondensing; and multistage steam turbines 100 to 2000 horsepower, condensing and noncondensing, steam extraction multiport valve gear.

CHAINS, SPROCKETS — Baldwin-Duckworth Chain Corp., Springfield, Mass., has issued catalog K-1 on chains and sprockets for power transmission, conveying and elevating. It describes and lists the company's standard roller chains, parts and attachments, multiple roller chains and other types. A section is devoted to practical engineering data of value to chain users, including rules and formulas for determining chain size, length, pitch, sprocket diameter and ratios, as well as much other information.

Steel Rate Turns Up; Stronger Price Sentiment

Heavier Shape Awards; Automobile Industry Releasing More Material



MARKET IN TABLOID

DEMAND . . . *Automotive improved moderately; shape awards heavier.*

PRICES . . . *Stronger sentiment; scrap lower.*

PRODUCTION . . . *Ingots up 1 point to 45.*

SHIPMENTS . . . *Steady.*

STRIKING greater resistance, after four consecutive weekly reductions, steelworks operations last week advanced 1 point to 45 per cent.

Ingot output now has been brought more in line with finished steel shipments, and any expansion or contraction in consumer requirements should become more quickly reflected in the steelworks operating rate over the next several weeks.

Among steel producers the belief persists that another peak in steel production is ahead for this quarter. The impending freight rate advances have not encouraged speculative buying, but after carefully analyzing the effect the new rates will have on costs, steelmakers are seriously considering a price rise for third quarter.

If this should develop there may be a repetition of the industry's experience last year, when a buying movement to rebuild stocks ahead of price increases for the third quarter carried the steel rate up to 63 per cent in June.

Consumers have been showing a tendency to close the gap between material stocks and finished products, particularly true in the automobile industry. While automobile assemblies still are on the increase, 109,000 units having been built last week, 1000 more than in the preceding week, steel releases have shown a slight but progressive reduction.

The industry is striving to cut its banks of manufactured parts and materials, which in January were sufficient for four weeks or more, down to reserves for about ten days, by June. So sharply did it curtail specifications recently that it has been compelled to re-enter the market, though not for such large tonnages as last month.

Structural shape awards last week increased to 27,997 tons, including 16,000 tons placed by the Great Lakes Steel Corp. for a strip steel mill building in Detroit, and 4000 tons for transmission towers by the Tennessee Valley authority. Independent of the government's $4,800,000,000 works relief program, which will not develop actual needs for steel until after July, structural work appears to be on the ascendancy. For the Fort Peck, Mont., and Alton, Ill., dams, 31,000 tons of shapes and reinforcing material are to be awarded this month.

Thousands of cities and smaller communities are rushing construction projects to obtain a slice of the huge federal appropriation, even in instances where they have no funds to supplement the work. The machine tool and heavy industries are expected to benefit quite as much as steel. It is estimated that at least $125,000,000 in road building equipment will be required for the highway and grade elimination work, for which $800,000,000 is to be expended.

For two tankers for the Gulf Refining Co., New York, 8000 tons of plates, shapes and bars have been awarded. The advance in railroad freight rates has stimulated demand for river barges at Pittsburgh, three active inquiries in the market calling for 6000 tons of plates. For pipe lines in Bronx and Queens, New York, 2700 tons of plates have been purchased.

Rail mill operations at Chicago have been stepped up slightly by recent awards. Fisher Body Corp. has ordered 100 50-ton box cars. Pennsylvania railroad has purchased steel for building 100 cement cars in its own shops, and a midwest trunk line, steel for 250 hopper cars.

Youngstown district steelworks operations last week advanced 5 points to 55 per cent; Buffalo 2 to 34; Chicago ½-point to 50½. Detroit was down 6 to 82; New England 1 to 52; Cleveland 5 to 64. Pittsburgh was unchanged at 34; Birmingham 55½; Wheeling 76; eastern Pennsylvania 29½.

STEEL's iron and steel composite is unchanged at $32.27; the finished steel index also is steady at $54, while the scrap composite is down 21 cents to $10.04.

COMPOSITE MARKET AVERAGES

	April 13	April 6	March 30	One Month Ago Mar., 1935	Three Months Ago Jan., 1935	One Year Ago Apr., 1934	Five Years Ago Apr., 1930
Iron and Steel	$32.27	$32.27	$32.30	$32.46	$32.58	$32.67	$34.16
Finished Steel	54.00	54.00	54.00	54.00	54.00	53.90	53.66
Steelworks Scrap	10.04	10.25	10.41	10.75	12.03	12.15	14.08

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel, hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

A COMPARSION OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished Material

	April 13, 1935	Mar., 1935	Jan., 1935	April, 1934
Steel bars, Pittsburgh	1.80c	1.80c	1.80c	1.85c
Steel bars, Chicago	1.85	1.85	1.85	1.90
Steel bars, Philadelphia	2.09	2.09	2.09	2.15¼
Iron bars, Terre Haute, Ind.	1.75	1.75	1.75	1.60
Shapes, Pittsburgh	1.80	1.80	1.80	1.80
Shapes, Philadelphia	2.00½	2.00½	2.00½	2.01¾
Shapes, Chicago	1.85	1.85	1.85	1.85
Tank plates, Pittsburgh	1.80	1.80	1.80	1.80
Tank plates, Philadelphia	1.98½	1.98½	1.98½	1.99¾
Tank plates, Chicago	1.85	1.85	1.85	1.85
Sheets, No. 10, hot rolled, Pitts.	1.85	1.85	1.85	1.90
Sheets, No. 24, hot ann., Pitts.	2.40	2.40	2.40	2.50
Sheets, No. 24, galvan., Pitts.	3.10	3.10	3.10	3.10
Sheets, No. 10, hot rolled, Gary	1.95	1.95	1.95	2.05
Sheets, No. 24, hot anneal., Gary	2.55	2.55	2.55	2.65
Sheets, No. 24, galvan., Gary	3.20	3.20	3.20	3.25
Plain wire, Pittsburgh	2.30	2.30	2.30	2.25
Tin plate, per base box, Pitts.	5.25	5.25	5.25	5.25
Wire nails, Pittsburgh	2.60	2.60	2.60	2.50

Semifinished Material

Sheet bars, open-hearth, Youngs.	$28.00	$28.00	$28.00	$28.40
Sheet bars, open-hearth, Pitts.	28.00	28.00	28.00	28.40
Billets, open-hearth, Pittsburgh	27.00	27.00	27.00	27.80
Wire rods, Pittsburgh	38.00	38.00	38.00	37.20

Pig Iron

	April 13, 1935	Mar., 1935	Jan., 1935	April, 1934
Bessemer, del. Pittsburgh	$19.76	$19.76	$19.76	$19.56
Basic, Valley	18.00	18.00	18.00	17.60
Basic, eastern, del. eastern Pa.	19.76	19.76	19.76	19.51
No. 2, foundry, del. Pittsburgh	19.26	19.26	19.26	19.06
No. 2 foundry, Chicago	18.50	18.50	18.50	18.25
Southern No. 2, Birmingham	14.50	14.50	14.50	14.25
No. 2X eastern, del. Philadelphia	20.63	20.63	20.63	20.38
Malleable, Valley	18.50	18.50	18.50	18.10
Malleable, Chicago	18.50	18.50	18.50	18.25
Lake Superior charcoal, del. Chi.	24.04	24.04	24.04	23.66
Ferromanganese, del. Pittsburgh	89.79	89.79	89.79	90.24
Gray forge, del. Pittsburgh	18.63	18.63	18.63	18.68

Scrap

Heavy melting steel, Pittsburgh	$11.50	$12.40	$13.50	$14.15
Heavy melt. steel, No. 2, east. Pa.	9.25	9.15	9.70	9.50
Heavy melting steel, Chicago	10.00	10.50	12.15	11.75
Rails for rolling, Chicago	11.00	11.65	12.90	12.75
Railroad steel specialties, Chicago	11.25	11.65	13.40	12.75

Coke

Connellsville, furnace, ovens	$3.60	$3.60	$3.60	$3.30
Connellsville, foundry, ovens	4.60	4.60	4.60	4.55
Chicago, by-product foundry, del.	9.25	9.25	9.25	9.25

Steel, Iron, Raw Material, Fuel and Metals Prices

Prices are code levels filed with American Iron and Steel Institute, 350 Fifth avenue, New York. Except when otherwise designated, prices are base, f.o.b. cars. Asterisk denotes price change this week.

Sheet Steel

Hot Rolled No. 10, 24-48 in.

Pittsburgh	1.85c
Gary	1.95c
Chicago, delivered	1.98c
New York, del.	2.18c
Philadelphia, del.	2.14c
Birmingham	2.00c
St. Louis, del.	2.17c
Pacific ports, f.o.b. cars, dock	2.40c

Hot Rolled Annealed No. 24

Pittsburgh	2.40c
Gary	2.50c
Chicago, delivered	2.53c
Detroit, delivered	2.60c
New York, del.	2.73c
Philadelphia, del.	2.69c
Birmingham	2.55c
St. Louis, del.	2.72c
Pacific ports, f.o.b. cars, dock	3.05c

Galvanized No. 24

Pittsburgh	3.10c
Gary	3.20c
Chicago, delivered	3.23c
Philadelphia, del.	3.39c
New York, del.	3.43c
Birmingham	3.25c
St. Louis, del.	3.42c
Pacific ports, f.o.b. cars, dock	3.70c

Tin Mill Black No. 28

Pittsburgh	2.75c
Gary	2.85c
St. Louis, delivered	3.07c

Cold Rolled No. 10

Pittsburgh	2.50c
Gary	2.60c
Detroit, delivered	2.70c
Philadelphia, del.	2.79c
New York, del.	2.83c
Pacific ports, f.o.b. cars, dock	3.10c

Cold Rolled No. 20

Pittsburgh	2.95c
Gary	3.05c
Detroit, delivered	3.15c
Philadelphia, del.	3.24c
New York, del.	3.28c

Enameling Sheets

Pittsburgh, No. 10	2.50c
Pittsburgh, No. 20	3.10c

Tin and Terne Plate

Gary base, 10 cents higher.

Tin plate, coke base con. (box) Pitts.	$5.25
Do., waste-waste	2.75c
Do., strips	2.50c
Long ternes, No. 24 unassorted, Pitts.	3.40c
Do., Gary	3.50c

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

Chrome-Nickel

	No. 302	No 304
Bars	23.00	24.00
Plates	26.00	28.00
Sheets	33.00	35.00
Hot strip	20.75	22.75
Cold strip	27.00	29.00

Straight Chromes

	No. 410	No. 430	No. 442	No. 446
Bars	17.00	18.50	21.00	26.00
Plates	20.00	21.50	24.00	29.00
Sheets	25.00	28.00	31.00	35.00
Hot strip	15.75	16.75	21.75	26.75
Cold stp.	20.50	22.00	27.00	35.00

Steel Plates

Pittsburgh	1.80c
New York, del.	2.08c
Philadelphia, del.	1.98½c
Boston, delivered	2.20c
Buffalo, delivered	2.03½c
Chicago or Gary	1.85c
Cleveland, del.	1.98½c
Birmingham	1.95c
Coatesville, base	1.90c
Sparrows Pt., base	1.90c
Pacific ports, f.o.b. cars, dock	2.35c
St. Louis, delivered	2.07c

Structural Shapes

Pittsburgh	1.80c
Philadelphia, del.	2.00½c
New York, del.	2.05½c
Boston, delivered	2.18½c
Bethlehem	1.90c
Chicago	1.85c
Cleveland, del.	1.98½c
Buffalo	1.90c
Gulf Ports	2.20c
Birmingham	1.95c
Pacific ports, f.o.b. cars, dock	2.35c

Bars

Soft Steel

Pittsburgh	1.80c
Chicago or Gary	1.85c
Duluth	1.95c
Birmingham	1.95c
Cleveland	1.85c
Buffalo	1.90c
Detroit, delivered	1.95c
Pacific ports, f.o.b. cars, dock	2.35c
Philadelphia, del.	2.09c
Boston, delivered	2.20c
New York, del.	2.13c
Pitts., forg. qual.	1.95c-2.05c

Rail Steel

To Manufacturing Trade

Pittsburgh	1.70c
Chicago or Gary	1.75c
Moline, Ill.	1.75c
Cleveland	1.75c
Buffalo	1.80c

Iron

Troy, N. Y.	1.70c
Terre Haute, Ind.	1.75c
Chicago	1.80c
Philadelphia	1.89c
Pittsburgh, refined	2.75-7.50c

Reinforcing

New billet, straight lengths, quoted by distributors.

Pittsburgh	2.05c
Chicago, Gary, Buffalo, Cleve., Birm., Young	2.10c
Gulf ports	2.45c
Pacific coast ports f.o.b. cars dock	2.45c
Philadelphia, del.	2.34c

Rail Steel

Straight lengths quoted by distributors

Pittsburgh	1.90c
Chicago, Buffalo, Cleveland, Birm., Young.	1.95c
Gulf ports	2.30c

Wire Products

(Prices apply to straight or mixed carloads; pool cars, or less, 15c up. 10% dis. on nail extras on stright or mixed carloads to one consignee.)

Base Pitts.-Cleve. 100 lb. keg.

Standard wire nails	$2.60
Cement coated nails	2.60
Galvanized nails, 15 gage and coarser	4.60c
do., 16 gage and finer	5.10c

(Per pound)

Polished staples	3.30c
Galvanized fence staples	3.55c
Barbed wire, galv.	3.00c
Annealed fence wire	2.45c
Galvanized fence wire	2.80c
Woven wire fencing (base column, c.l.)	$63.00
Plain wire, 6-9 gage to mfg. trade	2.30c

Anderson, Ind., (merchant products only) and Chicago up $1; Duluth up $2; Birmingham up $3.

Spring wire, Pittsburgh or Cleveland	2.90c

Do., Chicago up $1, Worcester, $2.

Cold-Finished Carbon Bars and Shafting

Base Pitts., one size, shape, grade, shipment at one time to one destination

10,000 to 19,999 lbs	1.95c
20,000 to 59,999 lbs.	1.90c
60,000 to 99,999 lbs.	1.85c
100,000 lbs. and over	1.82½c

Gary, Ind., Cleveland, up 5c; Buffalo, up 10c; Detroit, up 20c; eastern Michigan, up 25c.

Alloy Steel Bars (Hot)

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem 2.45c

Alloy S.A.E.	Diff.	Alloy S.A.E.	Diff.
2000	0.25	3100	0.55
2100	0.55	3200	1.35
2300	1.50	3300	3.80
2500	2.25	3400	3.20

4100 0.15 to 0.25 Mo.....0.50
4600 0.20 to 0.30 Mo. 1.25-1.75 Ni. 1.05
5100 0.80-1.10 Cr.....0.45
5100 Cr. spring.....base
6100 bars 1.20
6100 spring 0.70
Cr., Ni., Van. 1.50
Carbon Van. 0.95
9250.....Carbon base plus extras

Piling

Pittsburgh	2.15c
Chicago, Buffalo	2.25c

Strip and Hoops

Hot strip to 23⅛-in.	
Pittsburgh	1.85c
Chicago, base	1.95c
Birmingham base	2.00c
Detroit, delivered	2.05c
Phila., delivered	2.14c
New York, del.	2.18c
Cooperage hoop,	
Pittsburgh	1.95c
Chicago	2.05c
Cold-rolled strip,	
Pitts., Cleve.	2.60c
Worcester, Mass.	2.80c

Rails, Track Material

(Gross Tons)

Standard rails, mill	$36.37½
Relay rails, Pitts.	
24-45 lbs.	$26.00
50-60 lbs.	$23.00
70-75 lbs.	$20.00
80-85 lbs.	$24.00
100 lbs.	$25.00
Light Rails, billet qual. Pitts., Chi.	$35.00
Do., reroll. qual.	34.00
Angle bars, mills	2.55c
Spikes, R. R. base	2.40c
Track bolts, base	3.55c
Tie plates, base	1.90c

Base, light rails 25 to 40 lbs.; 50 to 60 lbs. inclusive up $5; 16 and 20 lbs., up $1; 12 lbs. up $8; 8 and 10 lbs., up $5. Base railroad spikes 200 kegs or more; base tie plates 20 tons.

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade for all case lots, Dec. 1, 1932, lists, 10% extra for less full containers.

Carriage Bolts

All sizes, cut thread	70-10-5 off
Rolled thread, ½ x 6, smaller	70-10-5 off

Machine Bolts

All sizes cut thread lag screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts stud bolts	70-10-5 off
Tire bolts	60-5 off
Stove bolts, 75 off in pkgs.; 83 off on 15,000 of 3-inch and shorter, or 5000 over 3-inch.	
Rolled thread machine, ½ x 6, smaller	70-10-5 off
Step bolts	70-5 off
Elevator bolts	70-5 off

Nuts

S.A.E. semifinished hex.; ½ to ⅞-inch	70-10-5 off
Do., ½ to 1-inch	70-10-5 off
Do., over 1-inch	70-5 off

Hexagon Cap Screws

Milled	85 off
Upset, 1-in., smaller	85 off

Square Head Set Screws

Upset, 1-in., smaller	70-10 off
Headless set screws	75 off

Rivets, Wrought Washers

Struc., c. l., Pittsburgh, Cleveland	2.90c
Struc., c. l., Chicago	3.00c
⅞-in. and smaller, Pitts., Chi., Cleve.	70 and 5 off
Wrought washers, Pitts., Chi., Phila., to jobbers & large nut, bolt mfrs.	$6.25 off

Cut Nails

Cut nails, Pitts.; (10% discount on size extras)	$2.75
Do. less carloads, 5 kegs or more no discount on size extras	$3.05
Do. under 5 kegs; no discount on size extras	$3.20

Pipe and Tubing

Base $200 net ton, except on standard commercial seamless boiler tubes under 2 inches and cold drawn seamless tubing.

Welded Iron, Steel Pipe

Base discounts on steel pipe, Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less. Chicago delivered 2½ points less. Wrought pipe, Pittsburgh base.

Butt Weld

Steel

In.	Blk.	Gal.
¼ and ⅜	53½	35
½	58½	47
¾	62	52
1—3	64	55

Iron

½	31½	15
¾	36½	20½
1—1¼	39½	25½
2	41½	26

Lap Weld

Steel

2	60	51
2½—3	63	54
3½—6	65	56
7 and 8	64	54
9 and 10	63½	53½

Iron

2	37	22½
2½—3½	38	25
4—8	40	28½

Line Pipe

Steel

½, butt weld	57½
⅛-inch, butt weld	50½
¼—⅜, butt weld	52½
¾, butt weld	61
1—3, butt weld	63
2-inch, lap weld	59
2½—3, lap weld	62
3½—6, lap weld	64
7—8, lap weld	63

Iron

⅛—1½ inch, black and galv. take 4 pts. over; 2½—6 inch 2 pts. over discounts for same sizes, standard pipe lists, 8—12-inch, no extra.

Boiler Tubes

C. L. Discounts, f.o.b. Pitts.

Lap Weld Steel		*Charcoal Iron*	
2—2¼	33	1¾	8
2½—2¾	40	2—2¼	13
3	47	2½—2¾	16
3¼—3½	50	3	17
4	52	3¼—3½	18
4½—5	42	4	20
		4½	21

In lots of a carload or more, above discounts subject to preferential of two 5% and one 7½% discount on steel and 10% on charcoal iron.

Lapwelded steel: 200 to 9999 pounds, ten points under base, one 5% and one 7½%. Under 2000 pounds 15 points under base, one 5% and one 7½%. Charcoal iron: 10,000 pounds to carloads, base less 5%; under 10,000 lbs., 2 points under base.

Seamless Boiler Tubes

Under date of May 15 in lots of 40,000 pounds or more for cold-drawn boiler tubes and in lots of 40,000 pounds or feet or more for hot-finished boiler tubes, revised prices are quoted for 55 cold-drawn boiler tube sizes ranging from ¼ to 6-inch outside diameter in 30 wall thicknesses, decimal equivalent from 0.035 to 1.000, on a dollars and cents basis per 100 feet and per pound.

Hot-finished carbon steel boiler tube prices also under date of May 15 range from 1 through 7 inches outside diameter, inclusive, and embrace 47 size classifications in 22 decimal wall thicknesses ranging from 0.109 to 1.000, prices also being on a lb. and 100 ft. basis.

Seamless Tubing

Cold drawn; f.o.b. mill disc.

100 ft. or 150 lbs.	32%
15,000 ft. or 22,500 lbs.	70%

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

6-in. & over, Birm.	$38.00-39.00
4-in., Birmingham	41.00-42.00
4-in., Chicago	49.00-50.00
6 to 24-in., Chicago	46.00-47.00
6-in. & over, east fdy.	42.00
Do., 4-in.	45.00

Class A pipe $3 over Class B.

Stnd. fitgs., Birm. base	$100.00

Semifinished Steel

Billets and Blooms

4 x 4-inch base; gross ton

Pitts., Chi., Cleve., and Youngstown	$27.00
Philadelphia	32.30
Duluth	31.00
Forging, Pitts., Chi. and Buffalo	32.00
Forging, Duluth	36.00

Sheet Bars

Pitts., Cleve., Young., Chi., Buff., Canton, Sparrows Pt.	28.00

Slabs

Pitts., Cleve., Young.	27.00

Wire Rods

(Common; combination up $2)

Pitts., Cleveland	38.00
Chicago	39.00
Worcester, Mass.	40.00

Skelp

Pitts., Chi., Young., Buff., Coatesville, Sparrows Point	1.70c

Coke

Price Per Net Ton

Beehive Ovens

Connellsville, fur.	$3.60
Connellsville, fdry.	4.60
Connel. prem. fdry.	5.10
New River fdry.	6.00
Wise county fdry.	4.45- 5.25
Wise county fur.	4.00- 4.50

By-Product Foundry

Newark, N. J., del.	9.20- 9.65
Chi., ov., outside del.	8.50
Chicago, del.	9.25
New England, del.	11.00
St. Louis, del.	9.25
Birmingham, ovens	6.00
Indianapolis, del.	8.75
Cincinnati, del.	9.30
Cleveland, del.	9.25
Buffalo, ovens	7.50- 8.00
Detroit ov., out. del.	8.50
Philadelphia, del.	9.00

Coke By-Products

Per gallon, producers' plants.

Tank lots	Spot
Pure and 90% benzol	15.00c
Toluol	30.00c
Solvent naphtha	30.00c
Commercial xylol	30.00c

Per lb. f.o.b. New York.

Phenol (200 lb. drums)	16.30c
Do. (100 lbs.)	17.30c

Eastern Plants, per lb.

Naphthalene flakes and balls, in bbls.	5.00c

Per 100 lb. Atlantic seaboard

Sulphate of ammonia	$1.20

†Western prices, ½-cent up.

Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25; 50c diff. for each 0.25 below 1.75. Gross tons.

Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$19.50	$20.00	$19.00	$20.50
Birdsboro, Po.	19.50	20.00	19.00	20.50
Birmingham, Ala., southern del.	14.50	14.50	13.50	19.00
Buffalo	18.50	19.00	17.50	19.50
Chicago	18.50	18.50	18.00	19.00
Cleveland	18.50	18.50	18.00	19.00
Detroit	18.50	18.50	18.00	19.00
Duluth	19.00	19.00	.....	19.50
Erie, Pa.	18.50	19.00	18.00	19.50
Everett, Mass.	19.50	20.00	19.00	20.50
Granite City, Ill.	18.50	18.50	18.00	.....
Hamilton, O.	18.50	18.50	18.00	19.00
Jackson, O.	20.25	20.25	19.75	.....
Neville Island, Pa.	18.50	18.50	18.00	19.00
Provo, Utah	17.50	.....	17.00	.....
Sharpsville, Pa.	18.50	18.50	18.00	19.00
Sparrows Point, Md.	19.50	.....	19.00	.....
Swedeland, Pa.	19.50	20.00	19.00	20.50
Toledo, O.	18.50	18.50	18.00	19.00
Youngstown, O.	18.50	18.50	18.00	19.00
Delivered from Basing Points:				
Akron, O., from Cleveland	19.76	19.76	19.26	20.26
Baltimore from Birmingham	20.02	.....	19.90	.....
Boston from Birmingham	19.62	.....	19.50	.....
Boston from Everett, Mass.	20.00	20.50	19.50	21.00
Boston from Buffalo	20.00	20.50	19.50	21.00
Brooklyn, N. Y., from Bethlehem	21.77	22.27	.....	.....
Brooklyn, N. Y., from Bmgham.	21.30	.....	.....	.....
Canton, O., from Cleveland	19.76	19.76	19.26	20.26
Chicago from Birmingham	†18.72	.....	18.60	.....
Cincinnati from Hamilton, O.	19.51	19.51	19.01	.....
Cincinnati from Birmingham	19.13	.....	19.01	.....
Cleveland from Birmingham	18.62	.....	18.50	.....
Indianapolis from Hamilton, O.	20.77	20.77	20.27	21.27
Mansfield, O., from Toledo, O.	20.26	20.26	19.76	20.76
Milwaukee from Chicago	19.50	19.50	19.00	20.00
Muskegon, Mich., from Chicago, Toledo or Detroit	21.40	21.40	20.90	21.90
Newark, N. J., from Birmingham	20.51	.....	.....	.....
Newark, N. J., from Bethlehem	20.89	21.39	.....	.....
Philadelphia from Birmingham	19.88	.....	19.76	.....
Philadelphia from Swedeland, Pa.	20.26	20.76	19.76	.....
Pittsburgh district from Neville Island	Neville base plus 63c, 76c and $1.13 switching charges			
Saginaw, Mich., from Detroit	20.60	20.60	20.10	21.10

Delivered from Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
St. Louis from Granite City, Ill.	19.00	19.00	18.50	.....
St. Louis from Birmingham	18.62	.....	18.50	.....
St. Paul from Duluth	20.94	20.94	.....	21.44

†Over 0.70 phos.

Low Phos

Basing Points: Birdsboro and Steelton, Pa., and Standish, N. Y., $23.50. Phila. base, standard and copper bearing, $24.63.

Gray Forge		Charcoal	
Valley furnace	18.00	Lake Superior fur.	21.00
Pitts. dist. fur.	18.00	Do., del. Chicago	24.04

Silvery†

Jackson County, O., base; 6% $22.75; 7—$23.75; 8—$24.75; 9—$25.70; 10—$26.75; 11—$27.75. Buffalo base prices, up $1.25.

Bessemer Ferrosilicon†

Jackson County, O., base; 10%—$27.75; 11—$28.75; 12—$30.25; 13—$31.75; 14—$33.25; 15—$34.75; 16—$36.25. Buffalo base prices $1.25 higher.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Refractories

Per 1000 f.o.b. Works

Fire Clay Brick

First Quality.

Pa., Ill., Ky., Md., Ga., Mo.	$45.00
Alabama	45.00

Second Quality

Pa., Ill., Ky., Md., Mo., Ga., Ala.	40.00

Ohio

First quality	$40.00-45.00
Intermediary	37.00
Second quality	28.00

Malleable Bung Brick

All bases	50.00

Silica Brick

Pennsylvania	$45.00
Joliet, E. Chicago	54.00
Birmingham, Ala.	52.00

Magnesite

Imported dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags) $45.00

Domestic dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags) 40.00

Domestic dead-burned gr. net ton f.o.b. Chewelah, Wash. (bulk) 22.00

Basic Brick

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	$45.00
Chemically bonded chrome brick	42.50
Magnesite brick	65.00
Chemically bonded magnesite brick	55.00

Fluorspar, 85-5

Washed gravel, duty paid, tide, net ton $18.75-19.00

Washed gravel, f.o.b. Ill., Ky., net ton, carloads $13.00-14.00

Ferroalloys

Dollars, except Ferrochrome

Ferromanganese, 78-82% tidewater, duty paid	85.00
Do., Balti. base	85.00
Do., del. Pittsburgh	89.79
Spiegeleisen, 19-20% dom. Palmerton, Pa., spot†	26.00
Do., New Orleans	26.00
Ferrosilicon, 50% freight all., cl.	77.50
Do., less carload	85.00
Do., 75 per cent	126-130.00
Spot, $5 a ton higher.	
Silicomang., 2½ carb.	90.00
2% carbon, 95.00; 1%,	105.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. con. del.	10.00
Ferrotungsten, stand., lb. cont. del.	1.35- 1.45
Ferrovanadium, 35 to 40% lb., cont., on analysis	2.70- 2.90
Ferrotitanium, c. l., prod. plant, frt. allow., net ton	137.50
Spot, 1 ton, frt. allow., lb.	7.00
do., under 1 ton	7.50
Ferrophosphorus, per ton, c. l., 17.-19% Rockdale, Tenn., basis, 18%, $2 unitage	50.00
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Anniston, Ala., 24% $2.75 unitage	65.00
Ferromolybdenum, stand. 55-65%, lb.	0.95
Molybdate, lb. cont.	0.80

†Carloads, Quan. diff. apply

Nonferrous Prices

METAL PRICES OF THE WEEK

Spot unless otherwise specified. Cents per pound

	Copper: Electro, del. Conn.	Copper: Lake, del. Midwest	Copper: Casting, refinery	Straits Tin: New York Spot	Straits Tin: New York Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 99%	Antimony Chinese Spot, N. Y.	Nickel Cathodes
April 6	9.00	9.12½	7.60	49.50	49.00	3.65	3.50	3.90	*19.00	14.25	35.00
April 8	9.00	9.12½	7.60	49.45	49.00	3.65	3.50	4.00	*19.00	14.25	35.00
April 9	9.00	9.12½	7.60	49.37½	48.95	3.65	3.50	4.00	*19.00	14.25	35.00
April 10	9.00	9.12½	7.60	49.62½	49.15	3.65	3.50	4.00	*19.00	14.25	35.00
April 11	9.00	9.12½	7.60	51.00	50.00	3.65	3.50	4.00	*19.00	14.25	35.00
April 12	9.00	9.12½	7.60	51.37½	50.25	3.65	3.50	4.05	19.00	14.25	35.00

*Nominal range 19.00 to 21.00c.

MILL PRODUCTS

F.o.b. mill base, cents per lb. except as specified. Copper, brass products based on 9.00c Conn. copper.

Sheets	
Yellow brass (high)	14.25
Copper, hot rolled	16.00
Lead, cut, to jobbers	7.25
Zinc, 100-lb. base	9.50
Tubes and Pipes	
High yellow brass	16.00
Seamless copper	16.25
Rods	
High yellow brass	12.75
Copper, hot rolled	13.25
Anodes	
Copper, untrimmed	13.75
Wire	
Yellow brass (high)	14.75

OLD METALS

Deal. buying prices, cents lb.

No. 1 Composition Red Brass	
*New York	4.50- 4.75
Cleveland	5.25- 5.50
Chicago	4.50- 4.75
St. Louis	4.75- 5.00
Heavy Copper and Wire	
*New York	6.00- 6.25
*Chicago, No. 1	5.87½-6.12½
Cleveland	5.75- 6.00
*St. Louis	5.50- 5.75
Composition Brass Borings	
*New York	4.00- 4.25
Light Copper	
*New York	4.75- 5.00
Chicago	4.37½-4.62½
Cleveland	4.75- 5.00
St. Louis	5.00- 5.12½
Light Brass	
Chicago	2.25- 2.50
Cleveland	2.50- 2.75
Lead	
New York	2.70- 2.80
Cleveland	2.50- 2.75
Chicago	2.62½-2.87½
St. Louis	2.75- 3.00
Zinc	
New York	1.87½-2.12½
Cleveland	2.00- 2.25
*St. Louis	2.25- 2.50
Aluminum	
Borings, Cleveland	8.00- 8.25
Mixed, cast, Clev.	11.75-12.25
Mixed, cast, St. L.	12.75-13.00
Clips, soft, Clev.	13.50-13.75

SECONDARY METALS

Brass ingot, 85-5-5-5	8.25
Stand. No. 12 Alum.	15.75-17.00

Iron and Steel Scrap Prices

Corrected to Friday night Gross tons delivered to consumers, except where otherwise stated

HEAVY MELTING STEEL

Birmingham	8.50- 9.00
Boston, dock, expt	8.25- 8.50
Boston, domestic	7.00- 7.25
Buffalo, No. 1	10.00-10.50
Buffalo, No. 2	8.00- 8.50
Chicago, No. 1	9.75-10.25
Cleveland, No. 1	9.00- 9.50
Cleveland, No. 2	8.50- 9.00
Detroit, No. 1	7.50- 8.00
Detroit, No. 2	6.50- 7.00
Eastern Pa., No. 1	10.00-10.50
Eastern Pa., No. 2	9.00- 9.50
Federal, Ill.	7.50- 8.00
Granite City, R. R.	8.25- 8.75
Granite City, No. 2	7.00- 7.50
N. Y., deal. No. 2	7.50
N. Y., deal. barge	9.00
Pittsburgh, No. 1	11.25-11.75
Pittsburgh, No. 2	10.00-10.50
St. Louis	7.25- 7.75
Valleys, No. 1	11.50-12.00

COMPRESSED SHEETS

Buffalo, dealers	8.00- 8.50
Chicago, factory	8.50- 9.00
Chicago, dealer	7.50- 8.00
Cleveland	8.00- 8.50
Detroit	7.75- 8.25
E. Pa., new mat	9.50
Pittsburgh	11.00-11.50
St. Louis	7.00- 7.25
Valleys	11.00-11.50

BUNDLED SHEETS

Buffalo	6.50- 7.00
Cincinnati, del.	6.00- 6.50
Cleveland	6.00- 6.50
Pittsburgh	10.00-10.50
St. Louis	4.50- 5.00

SHEET CLIPPINGS, LOOSE

Chicago	5.50- 6.00
Cincinnati	5.50- 6.00
Detroit	5.00- 5.50
St. Louis	4.00- 4.50

STEEL RAILS, SHORT

Birmingham	11.50-12.00
Buffalo	11.00-11.50
Chicago (3 ft.)	12.00-12.50
Chicago (2 ft.)	12.50-13.00
Cincinnati, del.	11.50-12.00
Detroit	9.50-10.00
Pitts., open-hearth, 3 ft. and less	14.00-14.50
St. Louis, 2 ft.& less	12.00-12.50

STEEL RAILS, SCRAP

Boston	7.00- 7.25
Chicago	9.75-10.00
Pittsburgh	11.50-12.00
St. Louis	9.00- 9.50

STOVE PLATE

Birmingham	6.00- 6.50
Boston, dealers	3.75- 4.00
Buffalo	9.00- 9.50
Chicago, net	6.00- 6.50
Cincinnati, dealers	5.50- 6.00
Detroit, net	5.75- 6.25
Eastern Pa.	8.00
N. Y., deal. fdry	6.00
St. Louis	5.50- 6.00

COUPLERS, SPRINGS

Buffalo	12.75-13.25
Chicago, springs	11.00-11.50
Eastern Pa.	13.50
Pittsburgh	14.00-14.50
St. Louis	9.00- 9.50

ANGLE BARS—STEEL

Chicago	11.00-11.50
St. Louis	10.00-10.50

RAILROAD SPECIALTIES

Chicago	11.00-11.50

LOW PHOSPHORUS

Buffalo, billets and bloom crops	12.00-12.50
Cleveland, billet, bloom crops	14.00-14.50
Eastern Pa., crops	13.00-14.00
Pittsburgh, billet, bloom crops	15.00-15.50
Pittsburgh, sheet bar crops	13.50-14.00
Pittsburgh, plate	12.75-13.25

FROGS, SWITCHES

Chicago	9.75-10.00
St. Louis, cut	9.00- 9.50

SHOVELING STEEL

Chicago	9.75-10.00
Federal, Ill.	7.50- 8.00
Granite City, Ill.	7.25- 7.75

RAILROAD WROUGHT

Birmingham	7.00- 7.50
Boston, dealers	6.00- 6.50
Buffalo, No. 1	8.00- 8.50
Buffalo, No. 2	10.00-10.50
Chicago, No. 1, net	8.50- 9.00
Chicago, No. 2	9.75-10.00
Cincinnati, No. 2	8.00- 8.50
Eastern Pa.	10.00-10.50
N. Y., No. 1, deal	7.25- 7.75
St. Louis, No. 1	6.00- 6.50
St. Louis, No. 2	7.50- 8.00

SPECIFICATION PIPE

Boston	3.00- 3.25
Eastern Pa.	9.00- 9.50
New York, dealers	3.50- 4.00

BUSHELING

Buffalo, No. 1	8.50- 9.00
Chicago, No. 1	8.00- 8.50
Cinci., No. 1, deal	6.00- 6.50
Cincinnati, No. 2	2.75- 3.25
Cleveland, No. 2	6.00- 6.50
Detroit, No. 1, new	6.50- 7.00
Valleys, new, No. 1	11.00-11.50

MACHINE TURNINGS

Birmingham	4.00- 4.50
Boston, dealers	1.00- 1.25
Buffalo	4.50- 5.00
Chicago	5.00- 5.50
Cincinnati, dealers	3.50- 4.00
Cleveland	5.00- 5.50
Detroit	3.50- 4.00
Eastern Pa.	5.50- 6.00
New York, dealers	1.75- 2.25
Pittsburgh	7.25- 7.75
St. Louis	3.00- 3.50
Valleys	8.00- 8.50

BORINGS AND TURNINGS

For Blast Furnace Use

Boston, dealers	3.25- 3.50
Buffalo	5.25- 5.75
Cincinnati, dealers	4.50- 5.00
Cleveland	6.00- 6.50
Detroit	4.50- 5.00
Eastern Pa.	5.00
New York, dealers	1.50- 1.75
Pittsburgh	6.00- 6.50

CAST IRON BORINGS

Birmingham, plain	4.00- 4.50
Boston, chemical	5.50- 6.50
Boston, dealers	3.25- 3.50
Buffalo	5.25- 5.75
Chicago	5.00- 5.50
Cincinnati, dealers	3.50- 4.00
Cleveland	6.50- 7.00
Detroit	4.50- 5.00
E. Pa., chemical	11.00-12.00
New York, dealers	1.50- 1.75
St. Louis	3.00- 3.50

PIPE AND FLUES

Cincinnati, dealers	5.00- 5.50

RAILROAD GRATE BARS

Buffalo	7.00- 7.50
Chicago, net	6.00- 6.50
Cincinnati	4.00- 4.50
Eastern Pa.	8.00
New York, dealers	4.00- 4.50
St. Louis	4.50- 5.00

FORGE FLASHINGS

Boston, dealers	4.50- 5.00
Buffalo	8.50- 9.00
Cleveland	8.00- 8.50
Detroit	6.50- 7.00
Pittsburgh	10.00-10.50

FORGE SCRAP

Boston, dealers	5.00- 5.25
Chicago, heavy	10.50-11.00
Eastern Pa.	9.50-10.00

ARCH BARS, TRANSOMS

St. Louis	9.50-10.00

AXLE TURNINGS

Boston, dealers	3.00- 3.50
Buffalo	7.50- 8.00
Chicago, elec. fur	9.50-10.00
Cleveland	7.00- 7.50
Eastern Pa.	9.00
St. Louis	6.50- 7.00

STEEL CAR AXLES

Birmingham	12.50-13.00
Boston, ship. point.	10.00-10.50
Buffalo	12.00-12.50
Chicago, net	13.50-14.00
Eastern Pa.	16.00
St. Louis	12.00-12.50

SHAFTING

Boston, ship. point.	11.75-12.00
Eastern Pa.	16.50
New York dealers	12.00-12.50
St. Louis	11.00-11.50

CAR WHEELS

Birmingham	8.00- 9.00
Boston, iron deal	6.00- 6.50
Buffalo, iron	11.00-11.50
Buffalo, steel	12.00-12.50
Chicago, iron	10.50-11.00
Chicago, rolled steel	10.50-11.00
Cincinnati, iron	8.00- 8.50
Eastern Pa., iron	10.50-11.00
Eastern Pa., steel	13.50
Pittsburgh, iron	12.00-12.50
Pittsburgh, steel	14.00-14.50
St. Louis, iron	7.00- 7.50
St. Louis, steel	9.25- 9.75

NO. 1 CAST SCRAP

Birmingham	8.50- 9.00
Boston, No. 1 mach.	8.50- 9.00
Boston, No. 2	7.50- 8.00
Boston, tex. con.	8.50- 9.00
Buffalo, cupola	10.00-10.25
Buffalo, mach.	10.25-10.75
Chicago, agri. net	8.00- 8.50
Chicago, auto	9.00- 9.50
Chicago, mach. net	9.00- 9.50
Chicago, railr'd net	8.00- 8.50
Cinci., mach. cup	8.50 9.00
Cleveland, cupola	11.50-12.00
Detroit, net	9.50-10.00
Eastern Pa., cupola	11.00-12.00
E. Pa., mixed yard	8.50- 9.50
Pittsburgh, cupola	11.75-12.25
San Francisco, del.	13.50-14.00
Seattle	7.00- 8.50
St. Louis, No. 1	8.00- 8.50
St. L., No. 1 mach.	8.50- 9.00

HEAVY CAST

Boston, del.	5.00- 5.50
Buffalo, break.	8.00- 8.50
Cleveland, break.	8.50- 9.00
Detroit, auto, net	9.50-10.00
Detroit, break.	7.00- 7.50
Detroit, auto net	9.50-10.00
Eastern Pa.	10.00-10.50
N. Y., break. deal	5.25- 5.75
Pittsburgh	10.75-11.25

MALLEABLE

Birmingham, R. R.	8.50- 9.50
Boston, consum.	12.00-12.50
Buffalo	12.00-12.50
Chicago, R. R.	12.50-13.00
Cincinnati, agri. del.	8.25- 8.75
Cleveland, rail	12.00-12.50
Detroit, auto	10.00-10.50
St. Louis, R. R.	9.00- 9.50
Eastern Pa., R. R.	11.00-11.50

RAILS FOR ROLLING

5 feet and over

Birmingham	10.00-10.50
Boston, dealers	8.00- 8.50
Buffalo	9.50-10.00
Chicago	10.75-11.25
Eastern Pa.	12.50-13.00
New York, dealer	7.50- 8.00
St. Louis	10.00-10.50

LOCOMOTIVE TIRES

Chicago (cut)	11.00-11.50
St. Louis, No. 1	9.00- 9.50

LOW PHOS. PUNCHINGS

Buffalo	12.00-12.50
Chicago	11.50-12.00
Eastern Pa.	13.00-14.00
Pittsburgh	13.00-13.50

Iron Ore

Lake Superior Ore

Gross ton, 51½% Lower Lake Ports

Old range bessemer	$4.80
Mesabi nonbess.	4.50
High phosphorus	4.40
Mesabi bessemer	4.65
Old range nonbess.	4.65

Eastern Local Ores

Cents, unit, del. E. Pa.

Foundry and basic 56-63% con. (nom.)	8.00- 9.00
Cop.-free low phos. 58-60% (nom.)	10.00-10.50

Foreign Ore

Cents per unit, f.a.s. Atlantic ports (nominal)

Foreign manganiferous ore, 45.55% iron, 6-10% man.	10.00
No. Afr. low phos.	10.00
Swedish basic, 65%	9.00
Swedish low phos.	10.00
Spanish No. Africa basic, 50 to 60%	9.00
Tungsten, spot, sh. ton unit, duty pd.	$17.75-18.25
N. F. fdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f.	$18.00-19.50

Manganese Ore

(Nominal)

Prices not including duty, cents per unit cargo lots.

Caucasian, 52-55%	26.00
So. African, 52%	26.00
So. Afr., 49-51%	24.00
Indian, 58-60%	nominal
Indian, 48-50%	nominal

Warehouse Iron and Steel Prices

Cents per pound for delivery within metropolitan districts of cities specified

STEEL BARS	
Baltimore*	2.90c
Boston††	2.95c
Buffalo	3.00c
Chattanooga	3.31c
Chicago	2.95c
Cincinnati	3.15c
Cleveland	2.95c
Detroit	3.03½c
Houston	3.00c
Los Angeles	3.60c
Milwaukee	3.06c
New Orleans	3.30c
New York‡(d)	3.22c
Pittsburgh(h)	2.90c
Philadelphia*	2.90c
San Francisco	3.60c
Seattle	3.60c
St. Louis	3.19c
St. Paul	3.00c
Tulsa	3.25c
IRON BARS	
Portland	3.40c
Chattanooga	3.31c
Baltimore*	3.00c
Chicago	2.75c
Cincinnati	3.15c
New York‡(d)	3.32c
Philadelphia*	2.90c
St. Louis	3.19c
Tulsa	3.25c
REINFORCING BARS	
Buffalo	2.60c
Chattanooga	3.31c
Chicago	2.10c-2.60c
Cleveland (c)	2.10c
Cincinnati	3.25c
Houston	3.25c
Los Ang., cl.	2.45c
New Orleans	3.50c
Pitts., plain (h)	3.05c
Pitts., twisted squares (h)	3.175c
San Francisco	2.45c
Seattle	2.45c
St. Louis	3.24c
Tulsa	3.25c
Young.	2.30c-2.60c
SHAPES	
Baltimore*	2.95c
Boston††	3.17c
Buffalo	3.25c
Chattanooga	3.56c
Chicago	3.20c
Cincinnati	3.40c
Cleveland	3.31c
Detroit	3.40c
Houston	3.00c
Los Angeles	3.60c
Milwaukee	3.31c
New Orleans	3.55c
New York(d)	3.37c
Philadelphia*	2.95c
Pittsburgh(h)	3.15c
Portland	3.55c
San Francisco	3.55c
Seattle	3.55c
St. Louis	3.44c
St. Paul	3.25c
Tulsa	3.50c
PLATES	
Baltimore*	2.95c
Boston††	3.18c
Buffalo	3.37c
Chattanooga	3.56c
Chicago	3.20c
Cincinnati	3.40c
Cleveland, ¼-in. and over	3.31c
Detroit	3.40c
Detroit, 3/16-in.	3.65 c
Houston	3.00c
Los Angeles	3.60c
Milwaukee	3.31c
New Orleans	3.55c
New York(d)	3.40c
Philadelphia*	2.95c
Phila. floor	4.95c
Pittsburgh(h)	3.15c
Portland	3.55c
San Francisco	3.55c
Seattle	3.55c
St. Louis	3.44c
St. Paul	3.25c
Tulsa	3.50c
NO. 10 BLUE	
Baltimore*	3.05c
Boston††	3.25c
Buffalo	3.62c
Chattanooga	3.36c
Chicago	3.05c
Cincinnati	3.20c
Cleveland	3.11c
Det., 8-10 ga.	3.13½c
Houston	3.35c
Los Angeles	3.70c
Milwaukee	3.16c
New Orleans	3.55c
New York	3.27c
Portland	3.75c
Philadelphia*	3.05c
Pittsburgh(h)	2.95c
San Francisco	3.75c
Seattle	3.75c
St. Louis	3.29c
St. Paul	3.45c
Tulsa	3.70c
NO. 24 BLACK	
Baltimore*†	3.51c
Boston (g)	3.90c
Buffalo	3.25c
Chattanooga	4.21c
Chicago	3.85c
Cincinnati	4.05c
Cleveland	3.91c
Detroit	3.98½c
Los Angeles	4.35c
Milwaukee	3.96c
New York	3.85c
Philadelphia*†	3.55c
Pitts.** (h)	3.55c
Portland	4.40c
San Francisco	4.40c
Seattle	4.40c
St. Louis	4.09c
St. Paul	3.695c
Tulsa	4.75c
NO. 24 GALV. SHEETS	
Baltimore*†	4.21c
Buffalo	4.00c
Boston (g)	4.60c
Chattanooga	4.86c
Chicago (h)	4.55c
Cincinnati	4.70c
Cleveland	4.61c
Detroit	4.70c
Houston	4.40c
Los Angeles	4.95c
Milwaukee	4.66c
New Orleans	4.95c
New York	4.50c
Philadelphia*†	4.25c
Pitts** (h)	4.15-4.45c
Portland	5.00c
San Francisco	5.00c
Seattle	5.00c
St. Louis	4.79c
St. Paul	4.19c
Tulsa	5.10c
BANDS	
Baltimore*	3.15c
Boston††	3.25c
Buffalo	3.42c
Chattanooga	3.61c
Chicago	3.30c
Cincinnati	3.45c
Cleveland	3.36c
Detroit, 3/16-in. and lighter	3.38½c
Houston	3.25c
Los Angeles	4.10c
Milwaukee	3.41c
New Orleans	3.95c
New York(d)	3.52c
Philadelphia	3.15c
Pittsburgh(h)	3.20c
Portland	4.25c
San Francisco	4.25c
Seattle	4.25c
St. Louis	3.54c
St. Paul	3.20c
Tulsa	3.45c
HOOPS	
Baltimore	2.30c
Boston	4.25c
Buffalo	3.42c
Chicago	3.30c
Cincinnati	3.45c
Det., No. 14 and lighter	3.38½c
Los Angeles	5.85c
Milwaukee	3.41c
New York	3.52c
Philadelphia	3.40c
Pittsburgh(h)	3.70c
Portland	5.60c
San Francisco	6.15c
Seattle	5.60c
St. Louis	3.54c
St. Paul	3.75c
COLD FIN. STEEL	
Baltimore (c)	3.56c
Boston	3.60c-3.85c
Buffalo (h)	3.40c
Chattanooga*	3.91c
Chicago (h)	3.35c
Cincinnati	3.55c
Cleveland (h)	3.35c
Detroit	3.48½c
Los. Ang.(f) (d)	5.70c
Milwaukee	3.46c
New Orleans	4.15c
New York	3.77c-4.27c
Philadelphia	3.58c
Pittsburgh(h)	3.30c
Portland (f)	5.85c
San Fran.(f) (d)	5.80c
Seattle (f) (d)	5.85c
St. Louis	3.59c
St. Paul	3.05c
Tulsa	4.50c
COLD ROLLED STRIP	
Boston, 0.100-in., 500 lb. lots	5.35c
Buffalo	3.39c
Chicago	3.27c
Cincinnati(b)	3.42c
Cleveland (b)	3.20c
Detroit	3.33c
New York	4.70c
St. Louis	3.36c

TOOL STEELS

(Applying on or east of Mississippi river; west of Mississippi 1c up)

	Base
High speed	57c
High carbon, high chrome	37c
Oil hardening	22c
Special tool	20c
Extra tool	17c
Regular tool	14c

Uniform extras apply

BOLTS AND NUTS

(100 pounds or over)

	Discount
Chicago (a)	70
Cleveland	70
Detroit	70
Milwaukee	70
Pittsburgh	70

(a) Under 100 pounds, 65 off.

(b) Plus straightening, cutting and quantity differentials; (c) Plus mill, size and quantity extras; (d) Minus quant. diff.; (e) New mill classif.; (f) Rounds only; (g) 50 bundles or over; (h) Outside delivery, 10c less.

‡Domestic bars; *Plus quan. extras; **Under 25 bundles; *†50 or more bundles; †New extras apply; ††Base 40,000 lbs., extras on less.

Prices on heavier lines are subject to new quantity differentials; 399 lbs. and less, up 50 cts.; 400 to 9999 lbs., base; 10,000 to 19,999 lbs., 15 cts. under; 20,000 to 39,999 lbs., 25 cts. under; 40,000 lbs. and over, 35 cts. under base.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, April 11

Export Prices f. o. b. Ship at Port of Dispatch—By Cable (or Radio)

	British gross tons U. K. ports		Continental Channel or North Sea ports, metric tons	
			Quoted in dollars	**Quoted in gold
PIG IRON	£ s d		at current value	pounds sterling £ s d
Foundry, 2.50-3.00 Silicon	$15.16	3 2 6	$13.99	1 14 0
Basic bessemer	13.34	2 15 0*	12.67	1 12 0
Hematite, Phos. .03-.05	15.16	3 2 6	.....	.....
SEMIFINISHED STEEL				
Billets	$26.68	5 10 0	$19.33	2 7 0
Wire rods, No. 5 gage	37.83	7 16 0	37.04	4 10 0
FINISHED STEEL				
Standard rails	$37.59	7 15 0	$45.88	5 10 0
Merchant bars	1.63c	7 10 0	1.17c to 1.22c	3 2 6 to 3 5 0
Structural shapes	1.60c	7 7 6	1.15c	3 1 6
Plates, †¼ in. or 5 mm.	1.74c	8 0 0	1.54c	4 2 6
Sheets, black, 24 gage or 0.5 mm.	2.01c	9 5 0	2.16c	5 16 0††
Sheets, gal., 24 gage, corr.	1.90c	8 15 0	2.42c	6 10 0
Bands and strips	1.84c	8 10 0	1.49c	4 0 0
Plain wire, base	2.01c	9 5 0	1.99c	5 7 6
Galvanized wire, base	2.44c	11 5 0	2.33c to 2.37c	6 5 6 to 6 7 6
Wire nails, base	2.60c	12 0 0	2.15c	5 15 0
Tin plate, box 108 lbs.	$ 4.34	0 18 2	.....	.....

British ferromanganese $85 delivered Atlantic seaboard, duty-paid. German ferromanganese £9 0s 0d $(43.74) f.o.b.

Domestic Prices at Works or Furnace—Last Reported

	£ s d		French Francs		Belgian Francs		Reich Marks
Fdy. pig iron, Si. 2.5	$16.37	3 7 6(a)	$17.16	260	$10.51	310	$25.39	63
Basic bessemer pig iron	16.37	3 7 6(a)*	12.21	185	9.49	280	28.01 (b)	69.50
Furnace coke	4.00	0 16 6	7.92	120	3.73	110	7.66	19
Billets	26.68	5 10 0	28.38	430	14.92	440	38.89	96.50
Standard rails	1.79c	8 5 0	2.08c	694	1.65c	1,100	2.42c	132
Merchant bars	1.87c	8 12 0	1.68c	560	.83c	550	2.01c	110
Structural shapes	1.90c	8 15 0	1.65c	550	.83c	550	1.97c	107.50
Plates, †¼-in. or 5 mm.	1.97c	9 1 3	2.10c	700	1.05c	700	2.32c	127
Sheets, black	2.28c	10 10 0§	2.55c	850‡	1.16c	775‡	2.64c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm.	2.82c	13 0 0	4.05c	1,350	2.25c	1,500	6.77c	370
Plain wire	2.01c	9 5 0	3.39c	1,130	1.65c	1,100	3.17c	173
Bands and strips	2.03c	9 7 0	1.95c	650	1.05c	700	2.32c	127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price British quotations are for basic open-hearth steel. Continental usually for basic-bessemer steel a del. Middlesbrough. b hematite. ††Close annealed

**Gold pound sterling carries a premium of 69 per cent over paper sterling.

Bars

Bar Prices, Page 74

Pittsburgh — Hot-rolled merchant steel bar producers have made no change in the 1.80c, Pittsburgh market, despite conjecture in some quarters that the recent reduction in cold-drawn bars of $3 a ton would be matched in the hot-rolled bar price. Even though the base price spread between hot-rolled and cold-finished is now but $3 a ton, size and quantity extras greatly increase this differential. Meanwhile, the soft steel bar market has been fairly well maintained from the standpoint of demand. Automotive buying is holding up and bar sellers report an unusually heavy volume of bar commitments originating with miscellaneous sources.

Cleveland—Hot-rolled steel bars are steady at 1.85c, base, Cleveland, despite recent pressure from consumers for lower prices, since cold-rolled bars were reduced $3 a ton. Automobile forging shops and partsmakers are receiving orders again in better volume, and this was reflected in the week's orders for steel and alloy steel bars. Some makers booked in the first ten days this month a tonnage equal to one-half the amount they received in all of March. Orders for rim stock have been heavier. Miscellaneous demand is fairly good, though individual lots are small..

Chicago—Steel bar sales and specifications show little change though automotive buying remains below its first quarter peak. Mills so far have encountered little pressure from consumers to match the price reduction now effective on cold-finished bars. The impending freight rate advance also has had little influence in stimulating shipments except in scattered instances. Bar demand from farm implement manufacturers is fairly steady, while needs of miscellaneous consumers generally are unchanged.

Boston—For die lock chain, 140 tons of nickel-steel bars are required for delivery at the Boston navy yard. Bids on 46 tons by nine sellers were alike at 4.246c, delivered. Quotations on the remainder close April 16. General demand continues spotty. Buyers of cold-finished held back orders until the $3 reduction became operative late last week. Commercial steel bars will be 2.22c, Boston, under the new increased freight rates.

New York—Demand for steel bars is sluggish with consumers pressing for concessions as a result of the recent reduction in cold-finished bars.

Philadelphia — Following the recent reduction of $3 per ton in mill price of cold-finished bars, consumers of hot-finished material continue to buy sparingly, and only for much needed requirements. Producers have shown no indication that they will follow the lead of cold finishers, but buyers await developments and continue to press for concessions.

Plates

Plate Prices, Page 74

Pittsburgh—Award of ten barges for Pfaff & Smith Supply Corp., Charleston, W. Va., on which bidders have had prices submitted for a month or more is expected soon. Last week, American Barge Line, Pittsburgh, inquired for four 175 x 40 x 11-foot barges, in which it plans to haul cotton and oil. To accommodate oil transportation it will need 24 tanks, six to a barge, each about 14 feet in diameter by 40 feet long, constructed so as to permit temporary installation. In addition, American Barge Line will buy a further lot of 24 tanks for use on some of its existing floating equipment.

Plate repair work is stil a feature. Dravo Contracting Co., Pittsburgh, is low at $3056 on April 4 bids for repairing the United States dredge BEAVER, and is also low at $2143 on April 9 bids for repairs to the towboat TECUMSEH. The Dravo concern is likewise low at $2970 on repairs to two steel whirler type derrick boats locally. Plates at 1.80c, Pittsburgh, are steady and unchanged.

Cleveland—After calculating their increased costs under the impending freight rate advances, steelmakers generally appear strong for an advance of $1 a ton in plates, shapes and bars for third quarter. If this should develop there might be a repetition in June of the industry's experience in that month last year, when price advances led to a buying movement which carried steelworks operations up to 63 per cent, the high point for the year. Demand for plates, however, is quiet, only small lots being specified by fabricators of tanks and manufacturers' equipment. For gates at six dams in the Muskingum, Ohio, conservancy district, bids went in last week on 35 tons of stainless steel plates and bars.

Chicago—While a fair amount of fabricated plate business is in prospect, releases are slow. A few oil companies are carrying out plant improvement and extension programs, a moderate tonnage having been placed for a gasoline cracking plant at St. Louis. Railroads and car builders are taking only limited plate tonnages, most business coming from fabricators and miscellaneous users.

Boston—New contract forms, covering increased freight charges on the delivery price of plates are being mailed consumers, 2.22c, Boston, to be the new quotation. Buying is limited to miscellaneous small lots, a standpipe at Hinsdale, N. H., being an exception. Bids are being taken on boiler plates for four destroyers by Boston navy yard.

New York—Platemakers note increased demand from oil companies, with some fair export business up for their account. Imperial Oil Co. will require a fair tonnage for a development in Colombia, S. A., and one or two other such projects are being figured. Gulf Refining Co., New York, is reliably reported to have placed its two tankers, recently noted as requiring 8000 tons of plates, shapes and bars, with Sun Shipbuilding Co., Chester, Pa.

Texas Co., New York, is inquiring for 3000 tons of plates for a solvent unit at Port Arthur, Tex.

Philadelphia — Platemakers are encouraged by prospects for improved ship work, with the Sun Shipbuilding Co., Chester, Pa., reported to have received the order for the two tankers for the Gulf Refining Co., requiring 8000 tons of plates, shapes and bars. This work will be in addition to the hull and superstructure for the Erie ferryboat, for which about 3300 tons probably will be placed shortly by the Sun company. This shipbuilder wil also make some heavy repairs, although machinery repairs mostly, to a dredge for the American Dredging Co., Philadelphia. Bids will be opened April 23 on lightship No. 112 for the United States lighthouse service, Washington, requiring 450 tons. The Turcenio Towing Co., Philadelphia, is asking bids on construction of a tug, requiring 100 tons. The Pennsylvania closed recently on steel for construction of 100 cement cars at Altoona, Pa. Miscellaneous tonnage includes a 15,000-gallon tank for Wilmington, Del.

San Francisco — The only plate award of size went to an unnamed interest and called for 200 tons for two 300-horsepower boilers for the state hospital at Camarillo, Calif. Oakland, Calif., is taking bids on 308 tons of 24 and 30-inch welded steel pipe and Torrance, Calif., is taking new bids April 23 for a 250,000-gallon tank and tower. Eureka, Calif., will open bids April 23 for a pipe line requiring close to 1600 tons.

Seattle—Several plate projects are pending but not yet up for figures. Tacoma, Wash., is about to call bids for a water system extension requiring 1800 tons. Coulee, Wash., dam will need 500 tons for penstocks and draft tubes and 600 tons of metal tubing but specifications are not out. Some material will be required for the Weyerhaeuser pulp plant at Ever-

ett and for improvements to the St. Helens, Oreg., pulp mill, George Buckler, Portland, general contractor.

Contracts Placed

8000 tons, including bars and shapes, two tankers, Gulf Refining Co., 17 Battery Place, New York, reported placed with Sun Shipbuilding Co., Chester, Pa.

2685 tons, 30-inch and under, steel pipe, water line extensions, South boulevard, Bronx, and Thirty-fifth avenue, Queens, New York, department of water supply, gas and electricity, New York, to Alco Steel Products Co., Dunkirk, N. Y.; pipe awarded by contractors.

345 tons, two steel dump scows for United States engineer office, Milwaukee, to McClintic-Marshall Corp., Bethlehem, Pa.

200 tons, two 300-horsepower boilers for state hospital, Camarillo, Calif., to unnamed interest.

200 tons, gasoline cracking plant, St. Louis, to Graver Tank & Mfg. Corp., East Chicago, Ind.

150 tons, water tower, Campbellsport, Wis.; to Chicago Bridge & Iron Works, Chicago.

125 tons, water tower, Marion, Wis., to Pittsburgh-Des Moines Steel Co., Pittsburgh.

Unstated tonnage, 50 twelve-foot lengths, 30-inch diameter steel shore pipe, United States engineer, Wilmington, N. C., to Gaynon Iron Works, Jacksonville, Fla.; circular 131.

Unstated tonnage, standpipe, Xenia, O., to Graver Tank & Mfg. Corp., East Chicago, Ind.

Contracts Pending

1600 tons, pipe line, Eureka, Calif.; bids April 23.

800 tons, four 175 x 40 x 11-foot combination cotton and oil barges, for American Barge Line, Pittsburgh; inquiry expected.

450 tons, including bars and shapes, lightship No. 112, United States lighthouse service, Washington; bids April 23.

308 tons, 24 and 30-inch welded steel pipe, East Bay municipal utility district, Oakland, Calif.; bids April 18.

245 tons, Crystal Springs pipe line tunnels, San Francisco; E. T. Lesure, Oakland, Calif., low on general contract.

175 tons, marine boiler plates, class B with maximum carbon content 0.35 per cent, delivery at following navy yards for destroyers now building: Boston, Philadelphia, Norfolk, Va., Mare Island, Calif., and Puget Sound, Wash., bureau of supplies and accounts, navy department, Washington, bids April 23, schedule 4722; bids also taken f.o.b. mill on material for Pacific coast yards; thickness of plates, $\frac{1}{4}$-inch to 3 inches.

153 tons, 250,000-gallon tank and tower, Torrance, Calif.; new bids April 23.

150 tons, water tower, Princeton, Wis.; bids April 18.

116 tons, spillway dam, Fort Peck, Mont.; Addison Miller Inc., St. Paul, Minn., general contractor.

100 tons, 36-inch siphon, United States Indian service, Ignacio, Colo.; bids April 12.

100 tons, including bars and shapes, tug, Turcenio Towing Co., Philadelphia; bids asked.

Unstated tonnage, 48 demountable tanks for eight barges, each approximately 14 x 40 feet, for American Barge Line, Pittsburgh.

Sheets

Sheet Prices, Page 74

Pittsburgh—Sheet buying is well supported by miscellaneous consumers, refrigerator and small motor industries. Automotive commitments show slight declines. Operations in the full-finished industry were fairly steady last week at about 78 per cent, with common black sheet output at 70 per cent. Galvanized output is down to 52 per cent and the jobbing mills have also lost ground slightly.

Cleveland—Sheet mill operations here during the week dropped 10 points to 65 per cent, and mills in an adjacent lake district which recently have been operating at capacity also slowed up to about 90 per cent. Specifications from automobile manufacturers continue to be received in large volume, some for shipment in May, but tonnage received so far this month is below the average for March. Demand is expected to pick up shortly, as partsmakers are receiving more releases. Manufacturers of refrigerators are increasing their specifications, while demand from stovemakers is quieter.

Chicago—Sheet demand is less active despite maintenance of fairly heavy requirements among miscellaneous consumers, particularly manufacturers of household equipment. With the automotive industry currently believed to be at its spring peak, sheet needs are unlikely to increase, though restricted buying of the past several weeks may be compensated for later. Producers of cold-rolled material still note heavy shipments, though backlogs are declining.

Boston—Two cents per 100 pounds will be added to the delivered price on sheets in this territory under the new freight charges. Demand is somewhat more spotty with routine industrial requirements fairly steady.

New York—Manufacturers of electric refrigerators and other lines of electrical household equipment are experiencing an unusually good season and their consumption of sheets continues heavy. Business, however, still is adversely affected by light building construction. Only in few cases, where the mills have the required material in stock, can shipments be placed on cars prior to the scheduled rate advance.

Philadelphia—The impending increase in freight rates has not stimulated sheet tonnage here. Some substantial tonnage orders may be closed this week by a local autobody manufacturer, who is now receiving releases from a middle western automobile builder for the first time in some weeks. Producers are now allowing jobbers, with whom they have signed agreements under the provisions of the steel code, $4 a ton on formed galvanized roofing, gages 26, 28 and 29. The former allowance was $2 a ton.

Buffalo—Sheet production continues at 70 to 75 per cent, with these schedules for the rest of this month.

Cincinnati—A decrease in demand since the first quarter is attributed entirely to more conservative automotive buying. Deliveries to manufacturers of stoves and refrigerators remain at a high mark. Mills are operating at 70 per cent.

St. Louis—Some reduction in new purchasing is noted here, but specifications and shipments are steady. For air conditioning equipment, St. Louis municipal auditorium, 225 tons will be required. William McDonald Construction Co., St. Louis, is general contractor.

Birmingham, Ala.—Mills still are operating at a good rate. Shipments are equal to the production.

Transportation

Track Material Prices, Page 75

Buying by railroads is light in all lines. New York Central has distributed its wheel requirements for second quarter but has taken no action on plates, shapes, bars and other steel for the same period. The Pennsylvania has awarded a few hundred tons of steel for construction of 100 cement cars in its shops at Altoona, Pa.

Merchants Dispatch Inc., Rochester, N. Y., has been awarded 100 box cars of 50-ton capacity by Fisher Body Corp., Detroit. A midwest trunk line will build 250 hopper cars in its own shops and has placed the steel. Board of transportation, New York, has held hearings on design and materials for 500 subway cars for the Eighth avenue line but has made no decision.

Buying of miscellaneous steel for repair purposes is being done irregularly, and makes a small total.

Car Orders Placed

Fisher Body Corp., Detroit, 100 box cars of 50 tons capacity, to Merchants Dispatch Inc., Rochester, N. Y.

Cold Finished

Cold Finished Prices, Page 75

Pittsburgh — Some resumption in cold-drawn bar buying has occurred since April 11, when the $3 a ton reduction became effective. The new market is now quoted 1.95c, base

Pittsburgh; 2.00c, Cleveland or Gary, Ind., and 2.05c, Buffalo. Aside from these four bases, the new equalized prices of 2.15c, Detroit, and 2.20c, eastern Michigan, are now operating.

Pipe

Pipe Prices, Page 75

Pittsburgh—In connection with the Texas-St. Louis-Detroit gas line, it was reported last week the Texas legislature had referred the project to a new committee, following a favorable report by one committee. This action is taken by some to indicate opposition to the undertaking. Present plans call for either 26-inch or 30-inch pipe in the PWA-financed line. A decision has been given against the use of small diameter pipe, because low pressures are wanted, involving the construction of fewer midway pressure boosting stations. Miscellaneous tubular product specifications are slightly ahead of the same March period and operations in the pipe producing industry are at about 35 per cent locally.

Cleveland—Many cities and small communities are making application for a slice of the $4,800,000,000 federal works relief appropriation reviving projects long dormant. This is expected to increase demand for pipe for water and sewer jobs. A few inquiries for small tonnages were in the market last week. Steel pipe shipments are restricted mainly to carloads for jobbers.

Chicago—While new orders and inquiries for cast pipe remain light, a fair amount of work for various municipalities is under consideration and the federal work relief appropriation is expected to aid the release of orders for some of these programs. Shipments against old contracts are slightly heavier.

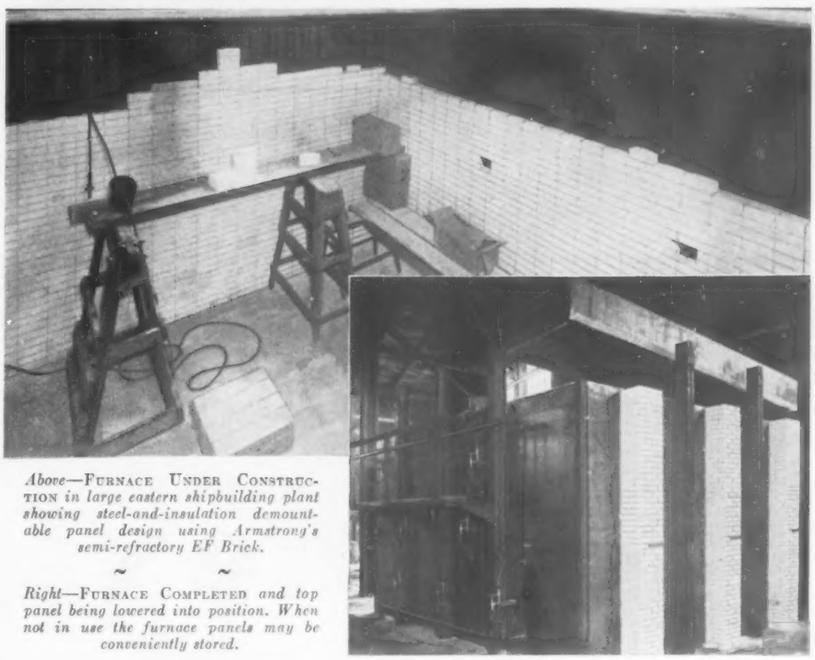
Boston—Cast pipe inquiry is moderately heavier with the metropolitan district commission, Boston, closing April 18 on 1442 tons of 20-inch cement-lined, with fittings. Merchant steel pipe activity is steady with distributors, but individual tonnage projects are lacking.

New York—Cast pipe activity is sluggish, two outstanding inquiries being close to 900 tons for Greenwood Lake, N. Y., on which bids are in, and 4000 tons for Palmyra, N. Y., alternates on welded steel, wrought and ingot iron pipe, closing April 16. For two steel pipe water line projects, New York city, Alco Products Corp., Dunkirk, N. Y., will fabricate 2685 tons of plates. Utilities are buying little pipe.

Birmingham, Ala. — Some new business is reported in cast iron pres-

CRUISERS *for* UNCLE SAM

..Lower Costs and Flexibility for the Shipbuilders



Above—FURNACE UNDER CONSTRUCTION *in large eastern shipbuilding plant showing steel-and-insulation demountable panel design using Armstrong's semi-refractory EF Brick.*

Right—FURNACE COMPLETED *and top panel being lowered into position. When not in use the furnace panels may be conveniently stored.*

***. . . with this knock-down panel-type furnace built of steel and* EF BRICK**

IT'S the big new idea in furnace construction—the light-weight, steel-and-insulation construction used in this stress relieving furnace built for a large eastern shipbuilding corporation. Armstrong's EF Brick, an insulating fire brick material, makes it possible. With this semi-refractory brick, high thin walls are now practical for the first time.

And here's another important construction feature of this efficient furnace. It's demountable—a flexible, panel-type furnace that can be used for heat-treating various large sizes and shapes . . . stored and set up at any location. The first use was for treating a 27-ton stern post of one of Uncle Sam's cruisers. It was built as a demountable furnace so it could be placed temporarily adjacent to a crane that could handle such a weight. After the stern post was lowered into position, the insulated panels which form the top of the furnace were bolted together into place. The insulation is standard EF Brick especially slotted to tie into angle irons on the steel shell. The low conductivity of this insulating fire brick permits the use of steel for the demountable panels.

This new steel-and-insulation construction saves overall costs. And more! It saves on fuel bills, too, because of greater speed with which furnaces walled with EF Brick are brought to temperature. You'll find this new type of construction equally satisfactory for ovens, ducts, large high-temperature chambers, and other heated equipment. Armstrong's EF Brick is recommended for temperatures up to 2475° F., and is available in all standard fire brick shapes and sizes as well as special shapes up to 12″ x 24″ x 4½″. For samples and full information, write to the Armstrong Cork Products Company, Building Materials Division, 985 Concord Street, Lancaster, Pennsylvania.

Armstrong's

HIGH TEMPERATURE PRODUCTS

Armstrong's* • EF • *Nonpareil

sure pipe trade, with producers fairly active on recent contracts.

San Francisco—Demand remains quiet and bookings for the week did not exceed 900 tons. So far this year municipalities have been in the market for exceptionally light tonnages.

Seattle—The market is slow and unimproved. Small lots are moving out of stock but no important projects are up for figures. Brewster, Wash., has rejected bids for water system improvements and extensions, postponing the product until funds are available.

Cast Pipe Placed

457 tons, 4 to 8-inch, class 150, Mountain Home, Idaho, to unnamed interest.

273 tons, 4 and 6-inch, class 150, Enterprise, Utah, to unnamed interest.

250 tons, 6 and 8-inch, Marion, Wis., to James B. Clow & Sons, Chicago.

200 tons, 20-inch, Madison, Wis., to James B. Clow & Sons, Chicago.

150 tons, Campbellsport, Wis.; American Cast Iron Pipe Co., Birmingham, Ala.

118 tons, Tremonton, Utah, to unnamed interest.

Cast Pipe Pending

1390 tons, 20-inch cement lines, bell and spigot, also 52 tons of fittings, metropolitan district commission, Boston; bids April 18.

1000 tons, Stickney, Ill., sewage disposal plant for Chicago sanitary district; Herlihy Mid-Continent Co., Chicago, general contractor.

634 tons, Orem, Utah; bids in.

100 tons, 6 and 10-inch, Walnut Park Mutual Water Co., Huntington Park, Calif.; bids in.

IRON ORE

All Lake Superior grades of iron ore

Five established brands of

PIG IRON

Federal Perry Iroquois
Toledo Zenith

COKE

For foundry, industrial and domestic uses

Chicago Solvay
Milwaukee Solvay
Perry Toledo
Waukegan
Zenith

By-product and Steam

COAL

Pickands, Mather & Co.

Cleveland - Chicago - Detroit - Erie - Toledo
Minneapolis - Duluth

Strip Steel

Strip Prices, Page 75

Pittsburgh—Cold-rolled strip steel operations have dipped a few points to 57 per cent of capacity. Automotive buying for May shipment is expected to steady the market at about its present levels. The 1.85c, Pittsburgh base on hot-strip and 2.60c, Pittsburgh or Cleveland, on cold strip are firm.

Cleveland—Releases from automobile manufacturers and partsmakers increased during the week, but from other sources demand was slower. Substantial tonnages of hot-rolled material were ordered by cold-rolling mills.

Chicago—Incoming strip business is lighter, though consumption by automotive and other leading industries has declined less than the recession in new orders. Backlogs are smaller than earlier in the year, consumers being more cautious in forward buying.

Boston—Cold-rolled strip volume has improved slightly with one or two producers, although in general sellers note little change. Buying continues in small lots, but such orders are fairly numerous. Hot strip specifications are spotty. Cold strip is 2.80c, Worcester, Mass.

New York—A price of 20c, Pittsburgh, has been filed with the code authority on cold-rolled stainless-clad steel strip, effective April 18. This is a new classification, with the material described as being "low carbon steel strip clad on both sides with stainless steel type No. 306 or type No. 320 to the extent of approximately 20 per cent of the total thickness on each side."

Philadelphia—Only in isolated cases does it appear that consumers of narrow strip are taking advantage of present freight rates by specifying tonnage for shipment before the freight increases of 2 cents per 100 pounds go into effect. The effective date now appears to be April 18. The new rates will bring the delivered price here up to 2.16c for hot-rolled, and 2.91c for cold-rolled.

Shapes

Structural Shape Prices, Page 74

New York—Structural steel awards are light and pending requirements are mainly for bridges. Bids are expected to be advertised in about two weeks for additional steel for the Triboro bridge, New York, about 25,000 tons in the aggregate for a span over the Bronx Kills and railroad yards, and a lift bridge over the Harlem river. New York and New Jersey have been allotted $26,904,000 for grade crossing eliminations from the works relief bill.

Identified projects for shipment beyond the date of the impending freight advances will not be affected by those increases provided orders are placed prior to April 18. Hence some projects are being pushed ahead.

Philadelphia — Featuring structural buying is the award of 750 tons for a high school in Cumberland, Md. Inquiry includes three or four projects ranging from 100 to 200 tons. Shapes are 1.90c, Bethlehem, Pa., with the delivered price to be advanced fractionally this week by the increase in freight rates.

New Jersey will receive $8,000,000 for highway projects and $6,000,000 for grade crossing eliminations under the federal work relief program. The relief bill makes the use of American materials mandatory. The Tennessee valley authority has awarded 4000 tons for transmission towers, the major portion going to the United States Steel Corp. units.

Boston—Bids on the general contract for repairs to the army base piers, Boston, taking close to 8000 tons, mainly piling, were postponed from April 9 to 16. Including 750 tons for a railroad grade elimination, Hartford, Conn., bridges active take approximately 1200 tons.

Pittsburgh — W. F. Trimble & Sons Co., Pittsburgh, is low on the general contract at $1,355,000 for the Allegheny county home, Woodville, Pa., requiring 500 tons. Among new inquiry is a 350-ton shop extension and digestor house at Lynchburg, Va., for the Meade Corp., as well as a heavier volume of other private work. The 1.80c, base, on plain structural material is firm.

Cleveland—Projects scheduled by city and county officials here will develop requirements for 8000 to 10,000 tons of shapes, if funds are received as expected from the government's $4,800,000,000 public works relief appropriation. Railroads also have ambitious plans for grade elimination, depending on federal aid, including 5000 tons for the Erie.

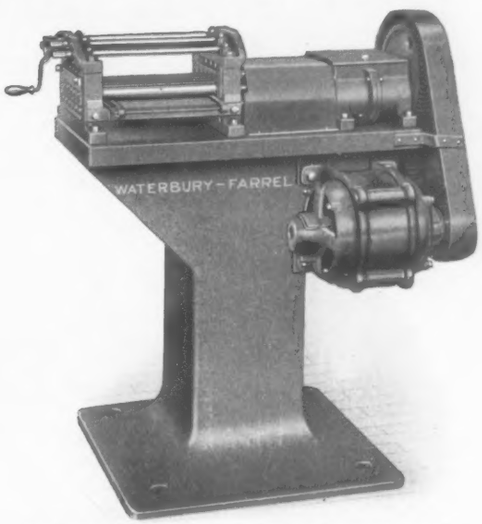
Chicago — In view of small tonnages involved in most new structural projects, interest in the market continues centered on larger public works, principally dams. Spencer, White & Prentis, New York, are low for the general contract on the Mississippi river dam at Alton, Ill., requiring 8000 tons of plates, shapes and miscellaneous parts, in addition to approximately

Action on several private and public building jobs on which bids have been submitted is delayed, and meanwhile purchases are small, though numerous.

Shape Awards Compared

	Tons
Week ended April 13	27,997
Week ended April 6	7,140
Week ended March 30	9,140
This week in 1934	16,827
Weekly average, 1934	16,284
Weekly average, 1935	15,815
Weekly average, March	20,670
Total to date, 1934	264,842
Total to date, 1935	237,236

Waterbury Farrel



ELEVEN ROLL STRAIGHTENER

BUILDERS OF ALL TYPES OF —
METAL STRAIGHTENING MACHINES
STRAIGHTENING & EDGING MACHINES
STRAIGHTENING & SCRUBBING MACHINES

WE WOULD LIKE TO MAKE RECOMMENDATIONS ON YOUR PROBLEMS

The Waterbury Farrel Foundry and Machine Company
Waterbury, Connecticut

OFFICES
CLEVELAND CHICAGO PHILADELPHIA

5000 tons of piling and 1336 tons of reinforcing bars. For the Fort Peck, Mont., dam spillway, 4600 tons are pending. Private construction is more prominent among inquiries, though tonnages involved are small. These include 650 tons for a warehouse at Peoria and 200 to 250 tons each for several factory buildings.

Detroit—Award of 16,000 tons of shapes for a strip steel mill building

Low Bids on 15,600-ton Fort Peck Dam Itemized

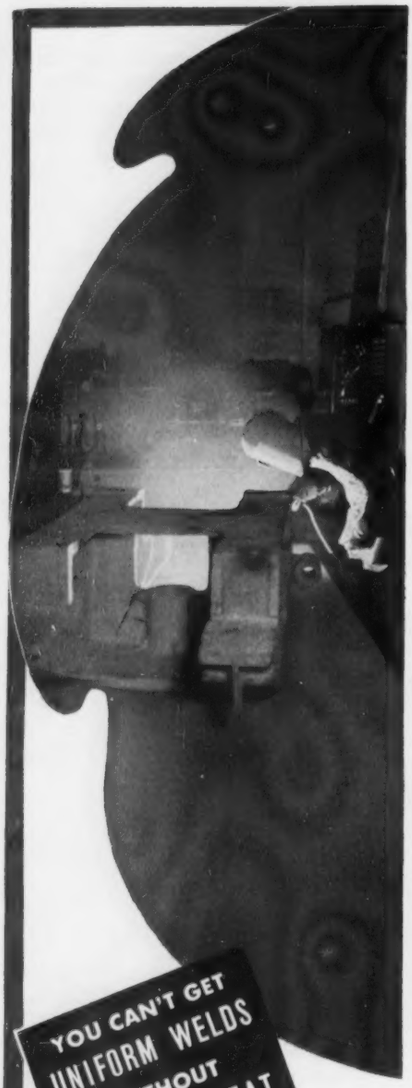
One of the largest tonnages of various steel products bid this year for government work in the West is that for spillway gate structure, cut-off structure and appurtenant work at the Fort Peck dam, Wiota, Mont.

This project requires approximately 11,000 tons of reinforcing material, and 4600 tons of shapes.

Bids were opened April 3. Addison Miller Inc. and Fielding & Shepley Inc., 1111 Builders Exchange building, St. Paul, were jointly low on the general contract at $3,985,423.50. Other bidders included: Spillway Builders Inc., Kansas City, at $4,387,426; Frazier-Davis Construction Co. and G. L. Tarlton Contractor Inc., St. Louis, $4,779,085.50, and Six Companies of Washington Inc., San Francisco, $5,147,796.50.

The low general contractor submitted the following bids:

	Pounds	Per Pound
Structural steel:		
Lift gates	2,120,000	0.059c
Bracing	1,000,000	0.062c
Bracing	2,500,000	0.054c
Ladders	16,500	0.012c
Service bridge	1,050,000	0.052c
Bronze bearing plate	15,100	0.40c
Steel bridge rail	126,000	0.6c
Miscellaneous:		
Structural steel	1,200,000	0.06c
Steel pipe	38,000	0.10c
Pipe hand rails	46,000	0.15c
Steel reinforcing bars	22,200,000	0.39c
Steel reinforcing fabric	10,000	0.08c
Corrosion resistant steel	104,000	0.40c
Bolts, screws and rivets	12,000	0.10c
Steel castings	540,000	0.13c
Cast nickel steel	3,000	0.25c
Forged steel	500	0.25c
Sheet material	25,000	0.15c
Iron castings	60,000	0.07c
Hardware	5,000	0.75c
Steel floor grating	130,000	0.11c
Brass	500	1.00c
Babbitt	50,000	0.20c
Wire fabric	2,700	0.08c
Corrugated metal pipe:	**Feet**	
18-inch	240	2.50c
24-inch	170	3.40c
36-inch	50	6.90c
48-inch	50	11.50c
Electrical conduit:	**Feet**	
½-inch	2,000	0.27c
¾-inch	2,000	0.34c
1-inch	1,200	0.50c
1¼-inch	2,500	0.67c
1½-inch	10,000	0.81c
2-inch	1,000	1.09c
2½-inch	1,000	1.71c
3-inch	1,000	2.25c
4-inch	1,000	3.25c
5-inch	1,000	4.43c



YOU CAN'T GET UNIFORM WELDS WITHOUT UNIFORM HEAT

● As the electric arc crackles along, it is important that heat remain as nearly constant as possible to produce a welded seam of uniform strength. Current fluctuations produce uneven penetration.

That's why welding experts recognize the value of P&H-Hansen's stable arc, accomplished through the patented internal stabilizer winding. But it means more than uniform welds. It means easier, faster welding with less dependence on human skill.

Before you buy your next welder, get comparative oscillograph records. You'll see the difference.

Ask for Bulletin HW-3

HARNISCHFEGER CORPORATION
4411 W. National Ave., Milwaukee, Wis.

P&H HANSEN ARC WELDERS

FOR DIFFERENT SERVICE REQUIREMENTS

● It's a simple matter to correct those common misapplications when you have P&H Convertible Motors. Standard interchangeable parts quickly adapt them to your special requirements. They protect you against complete replacements . . . avoid long delays that might tie up production. Yet you pay no premium for it.

P&H Convertible Motors are offered in either Squirrel Cage or Slip Ring types, from ½ to 125 H. P.

New bulletins are available to give you full details. A post card will bring them.

HARNISCHFEGER CORPORATION
4411 W. National Ave., Milwaukee, Wis.

P&H CONVERTIBLE MOTORS

here for the Great Lakes Steel Corp., subsidiary of the National Steel Corp., features the market. The tonnage was increased from an original estimate of 10,300 tons, and it was evenly divided between Whitehead & Kales Co., Detroit, and Fort Pitt Bridge Works, Pittsburgh.

San Francisco — The structural shape market was the most active one of the week and awards were the highest in over a month, aggregating 2980 tons. Outstanding were 1400 tons for a plant for the Consolidated Aircraft Corp., San Diego, Calif., placed with Consolidated Steel Corp. New inquiries include 170 tons for a plant in Berkeley, Calif., for the American Forge Co.

Seattle — Pacific Car & Foundry Co., Seattle, has booked 515 tons for the Bonneville, Oreg., lock project. This includes 350 tons for two nickel-steel stop log portable dams, 65 tons of nickel steel castings, and 100 tons for two derricks, the latter to be fabricated by Washington Iron Works, Seattle. About 500 tons for a mixing plant for the general contractors at the Coulee, Wash., dam have been awarded the C. S. Johnson Mfg. Co. At Coulee, also, 800 tons will be required for a powerhouse, but other specifications are not yet out.

Shape Contracts Placed

16,000 tons, strip steel mill building at Detroit for Great Lakes Steel Corp., subsidiary of National Steel Corp.; evenly divided between Whitehead & Kales Co., Detroit, and Fort Pitt Bridge Works, Pittsburgh.

4000 tons, transmission towers for Tennessee valley authority, Washington; major portion to United States Steel Corp. units.

1400 tons, plant for Consolidated Aircraft Corp., San Diego, Calif., to Consolidated Steel Corp., Los Angeles.

750 tons, high school, Cumberland, Md., awarded through George Hazelwood, contractor, that city, to Lehigh Structural Steel Co., Allentown, Pa.

665 tons, state highway bridge, Washington parish, Louisiana, to Jones & Laughlin Steel Corp., Pittsburgh.

515 tons, two portable dams, castings and two derricks for Bonneville, Oreg., lock project, to Pacific Car & Foundry Co., Seattle.

500 tons, mixing plant for Coulee, Wash., dam project, to C. S. Johnson Mfg. Co.

400 tons, buildings, state hospital, Taunton, Mass., to Haarmann Steel Co., Holyoke, Mass.; Thomas O'Connor & Co., Cambridge, Mass., general contractor. Previously reported as tentatively placed with same fabricator.

400 tons, dormitory, Smith college Northampton, Mass., to Lehigh Structural Steel Co., Allentown, Pa.; E. J. Pinney Inc., Springfield, Mass., general contractor.

400 tons, state highway bridge NRS 404-B, Alfalfa county, Oklahoma, to Patterson Steel Co., Tulsa, Okla.

350 tons, high school, Calumet City, Ill., to Duffin Iron Co., Chicago.

350 tons, Stephen Foster memorial building, Pittsburgh, for University of Pittsburgh, to McClintic-Marshall Corp., Bethlehem, Pa.; through W. F. Trimble Co., Pittsburgh.

250 tons, 200 structurals and 50 bars, 6-story addition, Genesee Brewing Co., Rochester, N. Y., to F. L. Heughes Co., Rochester, N. Y.; J. B. Pike & Sons Inc., Rochester, general contractor. Reported last week as 100 tons or more.

200 tons, Lowell junior high school, Long Beach, Calif., to Pacific Iron & Steel Co., Los Angeles.

200 tons, factory building, Detroit, for American Metal Products Co., to R. C. Mahon Co., Detroit.

200 tons, building additions, Charleston, W. Va., and Alloy, W. Va., for Union Carbide & Carbon Corp., New York, to Virginia Bridge & Iron Co., Roanoke, Va.

190 tons, Central school, Schroon Lake, N. Y., to Smith & Caffrey Co., Syracuse, N. Y.; W. E. Irish & Co., Syracuse, N. Y., general contractor.

185 tons, highway project, route 161, section 122VC, St. Clair, Ill., to Omaha Steel Co., Omaha.

175 tons, derrick, Chase, Kans., to Tulsa Boiler & Machinery Co., Tulsa, Okla.

175 tons, bridge, Belleville, Ill., to St. Louis Structural Steel Co., East St. Louis, Ill.

"WE RECOMMEND INDUSTRIAL BROWNHOIST CRANES"

THE BELMONT IRON WORKS

Steel erection work demands the best in men . . . and cranes! That Industrial Brownhoists do deliver real performance is proved by statements like the following from the Belmont Iron Works.

"We have found that the Industrial Brownhoist is particularly adapted to the erection of steel, due to the accurate control that the operator has of the load at all times. At the present time, we are using two Industrial Brownhoist locomotive cranes purchased in 1918 and 1920, and which are still in one hundred percent condition for our purposes.

"These machines have been extremely economical to operate and maintain, in view of the heavy service which we have given them. We have no hesitancy in recommending Industrial Brownhoist machines from our experience with them."

INDUSTRIAL BROWNHOIST CORPORATION
General Offices: Bay City, Michigan
District Offices: New York, Philadelphia, Chicago, Cleveland

INDUSTRIAL BROWNHOIST

175 tons, bridges, Missouri, to Stupp Bros. Bridge & Iron Co., St. Louis.

155 tons, car ferry apron, pier 43, San Francisco, to Ingalls Iron Works Co., Birmingham, Ala.

150 tons, state highway bridge over Yellow river, Milton, Fla., to McClintic-Marshall Corp., Bethlehem, Pa.

150 tons, addition to Placentia Orange Growers association, Placentia, Calif., to Pacific Iron & Steel Co., Los Angeles.

135 tons, state undercrossing Ellensburg, Wash., to Wallace Bridge & Structural Steel Co., Seattle.

127 tons, store, Enterprise Realty Co., Brockton, Mass., to John E. Cox Co., Fall River, Mass.; T. F. Crowell & Sons, Brockton, general contractors. Truscon Steel Co., Youngstown, O., awarded small tonnage of reinforcing bars.

125 tons, nurses' home, St. Mary's hospital, Philadelphia, to Belmont Iron Works, Eddystone, Pa.

115 tons, high school, Auburn, Mass., to Eastern Bridge & Structural Co., Worcester, Mass.; M. S. Kelliher Co., Boston, general contractor. Truscon Steel Co., Youngstown, O., awarded small tonnage of reinforcing steel.

110 tons, state highway bridge NRS 724-A, Lee county, Texas, to North Texas Iron & Steel Co., Dallas, Tex.

Unstated, traveling crane for Coulee, Wash., dam project, to Bedford Foundry & Machine Co., Bedford, Ind.

Detroit's Newest Downtown Hotel

DETROIT LELAND

800 OUTSIDE ROOMS with BATH
$2.50 single $3.50 double

Famous for Fine Foods
Club Breakfasts—
30c . . . 50c . . . 75c
Lunches—
40c . . . 50c . . . 75c
Dinners—
75c . . . $1 . . . $1.25

From the moment you enter our doors you will know that here you are indeed a *guest*. You will appreciate the courteous, cheerful, but *unobtrusive* service for which the Leland is noted. You will revel in the luxury you have a right to expect in a hotel that's as modern as tomorrow's motor car. You will like the superbly convenient downtown location. We hope you will accept our invitation to make the Leland your home in Detroit.

GARAGE IN CONNECTION

(AT CASS AND BAGLEY AVENUES)

DETROIT

Shape Contracts Pending

8000 tons, plates, shapes, castings, forgings, etc., also approximately 5000 tons of piling, Alton, Ill., dam; Spencer, White & Prentis, New York, low for general contract.

4600 tons, structural steel lift gates, bracing, service bridge and miscellaneous requirements, spillway gate structure, cut-off structure and appurtenant work, Fort Peck dam, Wiota, Mont.; Addison Miller Inc. and Fielding & Shepley Inc., 1111 Builders Exchange building, St. Paul, low on general contract at $3,985,423.50. Project also includes 11,174 tons of reinforcing steel.

650 tons, warehouse, Hiram Walker & Sons Inc., Peoria, Ill.

500 tons, Allegheny county home, Woodville, Pa.; W. F. Trimble & Sons Co., Pittsburgh, low on general contract at $1,355,000.

500 tons, high school, Newburyport, Mass., plans accepted, bids soon; estimated cost $500,000.

250 tons, building, International Harvester Co., Houston, Tex.

250 tons, bridges, Chicago, Milwaukee, St. Paul & Pacific railroad.

250 tons, sewage disposal plant, Stickney, Ill.

200 tons, sewage disposal plant, unit 2, Washington; bids April 22.

175 tons, Friends' boarding house, Westchester, Pa.; bids April 16.

140 tons, state undercrossing, Tenino, Wash.; bids in.

102 tons, state bridge, Tate county, Mississippi; bids April 16.

100 tons, one 180-ton transfer car, specification 673-D, Boulder dam, Boulder City, Nev.; bids April 18.

100 tons, repairs to Fleming road bridge, Allegheny county, Pa.; bids April 16.

100 tons, plant addition, Rogers Brown-Lavino Co., Plymouth Meeting, Pa.; bids asked.

100 tons, addition, box factory, Kieckefer Container Co., Delair, N. J.; bids asked.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet, Prices, Page 75

Due to comparatively heavy bolt and nut releases to Pittsburgh suppliers late in March, April shipments are slower. Accordingly, larger users have not fully tested the advanced market of 70-10-5 off, which was announced March 1 for second quarter. Large rivets are 2.90c, Pittsburgh and Cleveland, 3.00c, Chicago, and small rivets are 70-5 off list.

At Cleveland, automotive specifications are steady, railroads have purchased several carloads of nuts and bolts, and jobber requirements are fairly good. Less resistance is noted from some consumers in signing new contracts at the recent price advance for nuts and bolts.

Light demand from jobbers and railroads limit sales at Chicago but automotive and farm implement builders are supporting the market.

Reinforcing

Reinforcing Bar Prices, Page 75

Chicago—Reinforcing bar awards of about 2000 tons are almost entirely for private projects. These include 890 tons for the Olson Rug Co. building and 300 tons for the Walgreen Co. warehouse here. Orders for Illinois bridge and highway work involve 475 tons. A large tonnage of bars still is pending and in prospect, principally for dams, highway work and other public projects. Placing of 11,000 tons for the Fort Peck, Mont., dam spillway is anticipated shortly. Low bidder for the general contract for the Mississippi river dam at Alton, Ill., taking 1336 tons, has been announced.

Cleveland—Austin Co., Cleveland, general contractors, has awarded Truscon Steel Co., Youngstown, O., 150 tons of bars for the Electro-Motive Corp.'s building, Chicago. Several hundred tons of bars will be required for the $15,000,000 sewage disposal plant at Buffalo, construction of which has been made mandatory by the state legislature. Bids went in last week on 100 tons for the Beach City, O., dam, in the Muskingum conservancy district.

Pittsburgh—Likely to be included in the $4,800,000,000 work relief program are numerous river improvement projects in this district, which will require large tonnages of reinforcing bars and mesh. It is expected that an allotment will be made for concrete walls and levees at Cincinnati amounting to over $900,000; and at Portsmouth, O., $200,000; Ironton, O., $310,000; Marietta W. Va., $861,000; New Richmond, Ind., $129,000, and the Cincinnati airport levee, $370,000. On a bid of $1,720,664, George M. Brewster & Son Inc., Bogota, N. J., have been awarded general contract for the Warsaw, O., dam, which takes over 700 tons of rail steel reinforcing bars.

Philadelphia—Reinforcing bar demand is dull. With an increase of 2 cents per 100 pounds scheduled to go into effect April 18, on the carload freight rate from Pittsburgh, billet steel bars, cut lengths, will soon be 2.36c, Philadelphia.

Boston—Reinforcing bar buying in small lots is fairly active, but aggregate volume is not heavy. Outlook for highway needs is brightened by the allotment of $23,490,000 for roads to the six New England states, from the works relief bill.

New York—Reinforcing bar lettings are small and new inquiry is sluggish. With heavy allotments for New York and New Jersey, highway and bridge requirements are expected to increase materially. First shipments of 750 tons for the last west-side elevated highway section, Manhattan, which finally went to the Truscon Steel Co., Youngstown, O., are being made.

Seattle—Demand is improving as larger projects assume definite proportions. Considerable tonnage in carload lots is pending. Alloway & Georg, Spokane, Wash., have the general contract for the $4,000,000 sulphite pulp plant, involving 12 structures, for the Weyerhaeuser Timber Co., Everett. About 1000

Concrete Awards Compared

	Tons
Week ended April 13	3,346
Week ended April 6	2,059
Week ended March 30	6,505
This week in 1934	3,856
Weekly average, 1934	4,084
Weekly average, 1935	4,725
Weekly average, March	5,506
Total to date, 1934	75,192
Total to date, 1935	70,884

A new short cut to
Product Improvement
and Cost Reduction

FURTHERING the already great services that aluminum and its alloys perform for all industry, Permite Semi-Permanent and Permanent Mold Castings bring greater strength, longer wear and worth-while reductions in machining and finishing costs.

Countless manufacturers have approved these smoother Permite castings. They are better in appearance and more homogeneous in cross section. Fine in grain, and free from common foundry defects, they adapt themselves to many product uses where lightness and strength are of paramount importance.

Users of Permite Castings enjoy the additional advantages of careful metal analysis and close metallurgical supervision by Permite's well-equipped laboratories. Microscopic X-ray examinations and tests for tensile strength and hardness are part of Permite's service.

Write for full information, or forward blueprint for guidance of our engineering department in making recommendations and quotations. There is no obligation.

ALUMINUM INDUSTRIES, Inc., Cincinnati, Ohio

PERMITE *Aluminum* CASTINGS

Permanent Mold ★ Semi-Permanent Mold ★ Sand Cast

tons of reinforcing will be used. The same firm has awarded to unstated interests 180 tons for storage bins for the Spokane Portland Cement Co., Spokane.

San Francisco—Awards were not numerous and aggregated less than 1000 tons. To date this year 35,809 tons have been placed as compared with 30,708 tons for the corresponding period in 1934. Unnamed interests took 256 tons for the Manual Arts high school, Los Angeles.

Reinforcing Steel Awards

890 tons, plant building, Olson Rug Co., Chicago, to Joseph T. Ryerson & Son Inc., Chicago.

435 tons, Illinois state bridge and road work; 250 tons to Joseph T. Ryerson & Son Inc., 135 tons to Calumet Steel Co., 100 tons to Concrete Engineering Co., Chicago.

300 tons, warehouse, Walgreen Co., Chicago, to Calumet Steel Co., Chicago.

256 tons, Manual Arts high school, Los Angeles, to unnamed interest.

200 tons, FERA letting, New York, to Kalman Steel Corp., Bethlehem, Pa.

180 tons, corn storage building, American Maize Products Co., Chicago, to Calumet Steel Co., Chicago.

180 tons, storage bins for Spokane Portland Cement Co., Spokane, Wash., to unstated interests; Alloway & Georg, Spokane, general contractors.

150 tons, building, Electro-Motive Corp., Chicago, to Truscon Steel Co., Youngstown, O.; through Austin Co., Cleveland.

135 tons, outfall sewer, metropolitan district of Hartford county, Hartford, Conn., to Truscon Steel Co., Youngstown, O.; A. I. Savin Construction Co., East Hartford, general contractor.

120 tons, county span, Port Angeles, Wash., to Northwest Steel Rolling Mills, Seattle.

100 tons, Davis & Hinman service station and garage, Evanstown, Ill., to Calumet Steel Co., Chicago.

100 tons, alterations to high school, Huntington Park, Calif., to unnamed interest.

100 tons, Consolidated Aircraft Corp., plant, San Diego, Calif., to unnamed interest.

100 tons, including bolts, nuts, etc., county span, Port Angeles, Wash., to Pacific Coast Forge Co., Seattle.

100 tons, administration building, John Dewey high school, Long Beach, Calif., to unnamed interest.

Reinforcing Steel Pending

6500 tons, aeration and settling tanks, Stickney, Ill., sewage disposal plant for Chicago sanitary district; Herlihy Mid-Continent Co., Chicago, general contractor.

4000 tons, Baltimore & Ohio railroad grade elimination work, Staten Island, N. Y.; bids indefinitely postponed.

1336 tons, Alton, Ill., dam; Spencer, White & Prentis, New York, low for general contract.

1000 tons, sulphite pulp mill for Weyerhaeuser Timber Co., Everett, Wash.; Alloway & Georg, Spokane, general contractors.

320 tons, bridge, New York, New Haven & Hartford railroad, Hartford, Conn.; bids in.

289 tons, pipe line, Eureka, Calif; bids April 23.

250 tons, warehouse, Hiram Walker & Sons Inc., Peoria, Ill.

103 tons, Succor creek division, Owyhee, Oreg., reclamation project; bids at Ontario, Oreg., May 1.

Tin Plate

Tin Plate Prices, Page 74

Pittsburgh—The tin plate market continues strong and engages the industry 85 per cent. Based on the present rate of activity, 1935 should account for 55,000,000 to 56,000,000 base boxes, or close to 2,750,000 tons. Obviously the present high rate of activity will not continue through the summer, but a good rate seems assured for at least another several months.

New York—Tin plate specifications are tapering slightly, although a heavy volume still is moving to consumers.

Wire

Wire Prices, Page 75

Pittsburgh—A continuing increase in specifications covering manufacturers' wire products has been recorded the past week. Based on present automotive assemblies over May and possibly June, the rate of buying in spring and spoke wire, and plain wire for varied parts manufacturing purposes is gaining. There is also a disposition on the part of automobile makers to replenish stocks of parts. In merchant products, contraction of rural buying is still noted. The market is quoted at 2.30c, Pittsburgh, for plain wire; $2.60 per keg for nails and $63 per base column on fencing.

Cleveland—Carload orders for wire and fencing are more plentiful, and some good orders for nails also were booked during the week. Shipments to automobile manufacturers show a further slight decline.

Chicago—Demand for manufacturers' wire and merchant products remains fairly steady. While business from the automotive industry is less active than during first quarter, consumption is holding and fairly heavy business is in prospect for several weeks. Miscellaneous consumers of manufacturers' wire are buying sparingly for early requirements, but demand has changed little.

Boston — Clip wire has been reduced $5 a ton to 3.45c, Worcester, Mass. Demand is maintained with specialties and wire entering into manufactured goods leading activity. During first quarter 962 tons of wire rods, mainly from Sweden, were imported in the Boston customs district.

New York—Bright line finished paper clip wire has been reduced 50 cents per 100 pounds to 3.35c, Cleveland, effective April 12; and to 3.40c, Chicago, and 3.45c, Worcester, Mass., effective April 14.

Philadelphia — Although spring wire continues to move in good volume, the wire market generally is less active than a fortnight ago. Jobbers appear to have good stocks on hand and while there is slightly better movement of nails out of warehouse, the mills are feeling little effect.

TUBE MILL
EQUIPMENT
OF MODERN
DESIGN

Let us know your problems and we will be glad to be of service to you.

40 years experience in building tube mills.

TAYLOR-WILSON MANUFACTURING CO.
MAIN OFFICE and WORKS
500 Thomson Ave.
McKEES ROCKS, PA.

Pig Iron

Pig Iron Prices, Page 76

Pittsburgh — In spite of the rail freight advances on iron ore, coke and limestone effective April 18, pig iron producers in this district consider the possibility of an advance from the present market as unlikely. The local market of $18.50 on foundry, $18 for basic and $19 for bessemer grades continues guaranteed without an advance over the balance of this quarter, and present indications do not point to the possibility of a price increase in the third quarter. Shipments are progressing on a large order for bessemer iron closed here about six weeks ago.

Cleveland—Light spot business, with few forward commitments, and further improvement in specifications and shipments feature the market. Forwardings to agricultural implement manufacturers during the week showed the best gains, while automotive tonnage was sustained. Sales in the week, at 1200 tons, were about half those of the preceding week. The Ohio state public utilities commission will give railroads and shippers a hearing April 16 on an increase in intrastate freight rates, in line with those authorized by the interstate commerce commission. Previously when emergency increases were made in interstate rates the Ohio commission did not agree to them for intrastate traffic until after some delay and pressure.

Chicago—Pig iron shipments so far this month approximate the March rate, while new business also is well maintained. The outlook for an improvement in shipments this quarter compared with the first period is seen favorable, with no definite recession in foundry operations yet in evidence. Automotive and farm implement plants retain previous gains in production, while only minor changes are noted in schedules of miscellaneous foundries. Some anticipatory shipments to escape the coming advance in freight rates are noted, though effects of this increase on deliveries have been minor.

Boston — A fraction less than 20 cents per gross ton will be the maximum increase in pig iron delivered in New England, or an advance of 7 per cent over the present freight rate when the new carrier charges become operative this week. Accumulation of freight charges on raw material assembly costs, however, will be a substantial item and when added to the higher freight on pig iron, the better part of $1 a ton will be consumed. Sellers express the opinion that pig iron prices will advance here for third quarter if the steel code is continued. Meanwhile buying is light and in small lots.

Philadelphia — Increase in freight rates, now scheduled for April 18, has had the effect of stimulating orders in a few cases, where fair tonnages have been involved. One order for 500 tons, which might not have been placed for another month, has been awarded for immediate shipment. However, the increase in rates is so small the average carlot buyer has seen no occasion for speeding up releases. Base prices are unchanged.

Buffalo—A cargo of pig iron for ports up the lakes has cleared from here, indicating the desire of shippers to move tonnage as promptly as possible. Several bargeloads also have cleared for the eastern seaboard in one of the earliest movements of all time on this waterway. Substantial additional tonnage is scheduled to move in the near future by lake and canal. April sales and deliveries are slightly ahead of those in the early part of March.

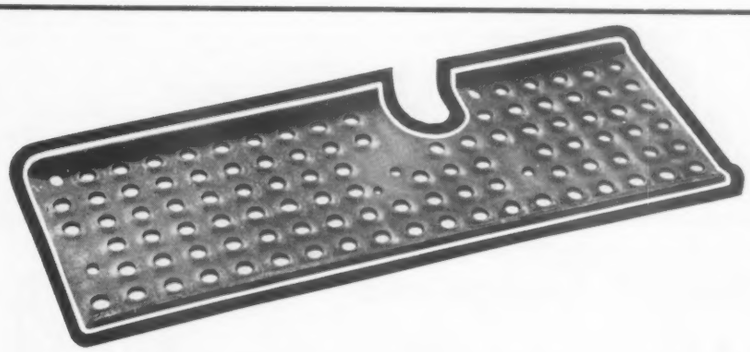
New York—Pig iron buying continues light but steady. Little fluctuation in shipments has been noted in the past three or four weeks. In general, proposed increases in freight rates have had little bearing on current business. It is reliably reported negotiations are under way between the Chateaugay Ore & Iron Co. here and the Davison Coke & Iron Co., Pittsburgh, for the production of Chateaugay low-phosphorus pig iron at the latter's Neville Island furnace for all western shipments.

Purchasing officer, Panama canal, Washington, closes April 23 on 200 tons of foundry pig iron for Panama delivery.

Cincinnati — Pig iron shipments match those in March when a peak tonnage since last June was moved. Specifications so far are for needs and not in anticipation of freight increases which would add 7 cents to the delivered Cincinnati quotation on northern iron. Southern furnaces, to maintain the price differential of 38 cents, would be required to absorb added freight charges of 18 cents.

St. Louis—Shipments of pig iron to melters in this district show decided increase over the March average. Despite strikes and threatened strikes, activities at mills, foundries and metalworking plants are holding up well.

Birmingham, Ala. — Production and shipments are steady, with such melters as pressure pipe manufacturers buying regularly for immediate delivery. Prospects are April



A SKID-PROOF STEP? *sure!*

Railroad freight car steps must safeguard a major hazard. Conditions to be met are extreme: ice, snow, grease, wet shoe soles. Something better than the old-fashioned step has long been needed.

The picture shows the solution offered a great railroad by Parish designing service—and accepted with enthusiasm, being immeasurably safer.

Look at that sharp, self-cleaning tread, and remember that we probably can do something good for you, too.

Why not send us YOUR blue prints AND SPECIFICATIONS?

PARISH PRESSED STEEL Co.

Specialists in difficult stamping design
Robeson & Weiser Sts.,
READING, PENNSYLVANIA

Pacific Coast Rep.: F. Somers Peterson Co., 57 California St., San Francisco, Cal.

production will equal March when 127,678 tons was reported.

Toronto, Ont.—Merchant pig iron sales continue about 600 tons weekly. The daily melt shows no general improvement, but a few new plants have resumed operations recently. Production is holding around 1200 tons daily with three stacks blowing.

Scrap

Scrap Prices, Page 77

Pittsburgh—A 25-cent per ton reduction in the scrap market was recorded early last week, but subsequently the market steadied at the reduced level, ranging around $11.25 to $11.75 for No. 1 heavy melting steel for local delivery. Although brokers are freely offering material at $11.50, no mill purchases have been recorded. The dealers' market seems to have tightened somewhat and prices of better than $10 have been paid for miscellaneous scrap, indicating that with yard preparation, a higher market is anticipated. Machine shop turnings have lost some of their recent ground, with brokers willing to pay little more than $7.25 for short orders.

Cleveland—Lack of demand for steel and iron scrap has caused prices to drop about 50 cents per ton here and in the valley, bringing heavy melting steel to $9 to $9.50 at Cleveland and $11 to $11.50 at Youngstown, O. Melters are not buying but shipments on contract are going forward in good volume except for some restrictions in the valley.

Chicago—Most scrap prices have declined 25 to 50 cents a ton, with heavy melting steel off 25 cents at $9.75 to $10 on moderate purchases at the latter figure. Sellers find it difficult to cover orders at less than $10, with only limited tonnages available at $9.75. Demand from all classes of scrap consumers is light.

Boston—Heavy cast and skeleton scrap are easier with heavy melting steel for export barely steady at $8.50, dock for No. 1. This price has been shaded 25 cents a ton in some instances. Domestic buying is light, although some breakable cast and machine turnings have moved to eastern Pennsylvania and Weirton, W. Va. New England consumers are buying little scrap.

New York—Domestic scrap buying continues sluggish. Dealers still pay $9 and $7.50, barge, for heavy melting steel grades against orders, but new export business is smaller. Opening of the barge canal has not resulted in any substantial buying for the Buffalo district due to low prices being paid by consumers in that territory.

Philadelphia — No. 2 heavy melting steel is up slightly but most other grades are lower, with general buying quiet. The increase in No. 2 steel followed a purchase of a round tonnage at $9.50, delivered, Conshohocken, Pa. Meanwhile, a leading exporter began holding up shipments at Port Richmond, due to a shortage of ship bottoms, and another exporter, while still taking shipments, is offering $8.25, wharf, for No. 2 which is 50 cents lower than the nominal price of the other exporter. No. 1 steel for domestic account has been reduced to a flat $10, delivered, by virtue of the purchase of several hundred tons by the leading Claymont, Del., consumer at that figure. Other grades recently reduced include steel axles, iron axles, cupola cast, knuckles and couplers, railroad grate bars, new compressed sheets, stove plate, axle turnings, machine shop turnings, cast wheels and No. 1 railroad wrought.

Buffalo—An offer to buy heavy melting steel at $10.50 for No. 1 is reported. Dealers feel that little material can be bought at $10 but admit a definite weakness has appeared in all grades of scrap. Prices have sagged in the face of lower offers although limited tonnage has changed hands at the new levels. Dealers contend the tonnage of scrap purchased for delivery by water has been greatly overstated by consumers. Some scrap has arrived, however, and more is expected later this month by lake and barge.

Detroit—Scrap prices appear to be holding at $7.50 to $8 for No. 1 melting steel and $7.75 to $8.25 for hydraulic compressed sheets, except for scattered weakness in rails, short turnings, auto malleable and forge flashings. Docks and storage space still are choked, as comparatively little scrap is moving out by water. Ford continues to throw down not only its own excess scrap but also heavy receipts from Murray and Briggs, chiefly bundles. Scrap dealers' protests against a reciprocal agreement between a large automobile manufacturing interest and a northern Ohio steel mill are understood to have cancelled half of the tonnage involved. Outside buyers still are loath to make commitments.

Cincinnati—Bids on railroad scrap during the past week reflected weakness although published quotations remain unchanged. The movement against contract continues fairly heavy, but mills have not made new commitments for several weeks.

St. Louis—Weakness and scant purchasing continue to feature the market for iron and steel scrap. While the melt at mills and foundries is well sustained, stocks appear sufficient for all needs and new commitments are rare.

Birmingham, Ala.—Buying lightly for spot needs consumers of steel and iron scrap give the market little support and recent decline in prices has not added to activity.

Seattle—Coast exporting houses are unable to meet prices offered by Japanese buyers, who base their ideas on Pittsburgh. Consequently Pacific scrap is out of line with Atlantic coast prices, and practically no

Special Carbon and Alloy Spring Wire

IRON STEEL QUALITY — WIRE — "SENECA"

The demand for SENECA Quality Special Spring Wire is increasing rapidly.

We are prepared to meet all demands.

We can supply practically all grades in rounds and

SHAPES and sizes from ½" to .004.

HIGHEST QUALITY GUARANTEED

Please send your inquiries with specifications

The Seneca Wire & Mfg. Company

FOSTORIA, OHIO

Established 30 Years

new business has been booked here for a fortnight. Shippers are still holding at $9.25 for No. 1 melting steel and $10.75 for rails. Shipments are dropping as old commitments end.

Toronto, Ont.—Minor improvement is reported in scrap sales. There is a better market for steel scrap in the Hamilton and Montreal areas. Turnings, however, are moving slowly. Export demand in good volume is expected for the near future. Foundries are furnishing a steady light tonnage demand for iron grades. Wrought scrap and machinery cast are the most active in the list, while odd sales of stove plate and malleable are reported.

Ferroalloys

Ferroalloy Prices, Page 76

New York — Running slightly counter to the downward trend in steelmaking, specifications for ferromanganese hold at a fairly good rate. This may be attributable in a measure to impending increases in freight rates, scheduled to become effective April 18. On shipments of ferromanganese into Pittsburgh the increase amounted to about 34 cents. The base price continues $85, duty paid, Atlantic and Gulf ports. Domestic spiegeleisen, 19 to 21 per cent, is $26 a ton, Palmerton, Pa., on lots up to 50 tons and $24, on 50 tons and over.

Semifinished

Semifinished Prices, Page 75

Announcement of freight rate increases has not caused much speculative buying of semifinished steel. The heaviest movement is noted in sheet and tin bars, for immediate needs. Tin plate producers are operating close to capacity. Pittsburgh base prices remain $27 for billets, blooms and slabs, $28 for sheet bars, and $38 for wire rods. Skelp is 1.70c, and tube rounds, 1.80c, Pittsburgh.

Metallurgical Coke

Coke Prices, Page 75

Metallurgical coke still reflects a low rate of foundry operations in the Pittsburgh district, and prices are weak and irregular. The Connellsville, Pa., oven market on standard furnace coke is nominally $3.60 for contracts with 25 cents up for spot, but spot shipments are in many cases being granted the $3.60 figure. Common foundry coke seems relatively steady at $4.60 per ton.

Shipments of foundry coke at Chicago are somewhat below the March rate but better than a year ago. Automotive and farm implement foundries are keeping up their rate but smaller users have decreased their requirements. At Cincinnati demand shows little change, with domestic coke at a higher rate, due to a cut in price. Production has been decreased at Birmingham, Ala.

Warehouse

Warehouse Prices, Page 78

Pittsburgh — Cold-drawn carbon steel bars have been reduced 15 cents per 100 pounds, to 3.30c for in-town Pittsburgh delivery for 400 to 1000-pound lots from warehouse. Other warehouse prices are unchanged. Demand appears to be stronger than last month.

Chicago—Cold-drawn bars have been reduced $3 a ton to 3.35c for city delivery and 3.25c for outside delivery. A similar reduction has been made at Milwaukee, both meeting the reduction announced recently by producers. Other prices are unchanged. Business is fairly steady, holding somewhat better than had been expected.

Cleveland—The reduction of $3 a ton in cold-rolled steel bars announced a week ago by warehouses has not stimulated buying. Orders and tonnage for warehouse materials showed further moderate decline during the week.

Detroit—Cold-finished bars have been reduced 15 cents by warehouses in conformity with the recent mill price adjustment. Demand for products out of warehouse remains comparatively strong and level. If a spring bulge develops it will have to come from the building industry.

Cincinnati — Sales of steel from warehouse are close to averages of the previous month, interests linked with fabricating shops not increasing activity in small tonnage for building work.

Boston—Warehouses have reduced cold-finished bar prices $3 a ton to 3.70c to 3.85c, following the recent decline in mill quotations. Volume with jobbers is slightly heavier with an increase in miscellaneous buying.

New York—Cold-finished bars have been reduced $3 a ton. Buying of steel out of warehouse continues to improve with demand well spread as to products.

Philadelphia — Following recent action by mills, jobbers late last week put a $3 reduction into effect on cold-

CROSBY STAMPINGS

Since 1896 the Crosby plant has been devoted, exclusively, to designing and producing Sheet Metal Stampings. Avail yourself of this experience. Send us your next stamping problem and watch results.

Manufacturers IDEAL TROLLEY WHEELS

THE CROSBY COMPANY
BUFFALO, N. Y.

Branch Offices

New York, Philadelphia, Cleveland, Detroit, Chicago.

finished bars, making the current market 3.58c. General warehouse buying appears about on a parity with that of the past three weeks or so. Should this rate be maintained, the showing for April will be better than for March.

Seattle—Sales from warehouse continue in good volume, country buying being stimulated by improved weather. Service station extensions and general tank work are adding to increasing demand from private and industrial sources.

St. Louis—Two weeks of almost uninterrupted rain have tended to slow down sales at iron and steel warehouses. Goods for use in the rural areas are moving in smaller volume than heretofore, but this demand continues potential.

Iron Ore

Iron Ore Prices, Page 77

Cleveland—While Lake Superior iron ore producers have not yet determined on prices for this season they feel they should not be required to absorb the freight rate advance of 11.2 cents per gross ton on the upper lake rail haul. They paid the emergency surcharges of 6.7 cents in 1932 and 1933. However, the Ford Motor Co., largest buyer in the open market, has not inquired, and as no other tonnage is up for figures prices may not be determined for at least two weeks. The Lake Superior Iron Ore association reports receipts at Lake Erie ports for the past 12 months, shipments therefrom, and dock balances April 1, as follows:

	Receipts	Shipments	Dock bal. Apr. 1,'35
Buffalo	1,630,319	8,571	2,871
Erie	902,533	939,133	94,997
Conneaut.....	3,294,610	3,469,565	1,685,696
Ashtabula...	1,742,708	1,972,982	1,273,652
Fairport	678,722	683,905	387,403
Cleveland....	4,035,905	2,727,325	779,381
Lorain	2,106,963	1,165,259	12,527
Huron	396,321	413,418	321,066
Toledo	784,442	403,519	11,705
Total	15,572,523	11,783,677	4,569,298
Year ago....	16,323,050	12,353,706	4,981,536

New York—Following the recently noted increase of ½-cent a unit on foreign low phosphorus ore, some sellers of foreign basic ore have withdrawn from the market in anticipation of a higher price. Currently, basic ore continues at 9c, per unit, alongside docks, Atlantic ports, but the price appears purely nominal. Much of the present strength in foreign ore prices is attributed to the active market abroad. Manganese ore prices are nominal at 26c, per unit, without duty, Atlantic ports, on material ranging around 52 per cent.

Philadelphia—Arrival of 5543 tons of chrome ore featured importations here during the week ended April 6. Of this amount 4000 tons came from Portuguese Africa and 1543 tons from Cuba. Other importations included 99 tons of ferromanganese from France, 82 tons of steel tubes from Sweden, 25 tons steel bars from Sweden, and eight tons structural shapes from Belgium.

Steel in Europe

Foreign Steel Prices, Page 78

London—(*By Cable*)—Pig iron is strong in Great Britain, especially in the Middlesbrough district, with substantial hematite consumption. Exporters are quiet. The steel trade is spotty, with rails and structurals most active. In the Midlands new business is wanting to replace bookings now being worked out. Exports of galvanized sheets are dull, domestic demand being fair. Tin plate inquiries are increasing.

The Continent reports export trade slightly improved, following readjustment of the belga, especially to the Argentine, Egypt and China.

Coke By-Products

Coke By-Product Prices, Page 75

New York—Demand for distillates continues brisk, and current production is moving directly into consumption. Naphthalene prices are steadier with additional improvement in shipments. Sulphate of ammonia is active, especially shipments to the south. Phenol is unchanged.

Quicksilver

New York—Quicksilver prices are unchanged and the market is quiet. Round lots of 100 virgin flasks of 76 pounds each are available at $72.50 a flask, while small lots of 15 to 24 flasks, inclusive, are $74. Single flasks command $75.

When you are having trouble finding the right metal for jobs where corrosion, vibration, or fatigue factors are tough, try Reading Genuine Puddled Wrought Iron—the metal of the ages.
For information, outline your needs to
READING IRON COMPANY
PHILADELPHIA
SCIENCE AND INVENTION HAVE NEVER FOUND A SATISFACTORY SUBSTITUTE FOR GENUINE PUDDLED WROUGHT IRON

Nonferrous Metals

Nonferrous Metal Prices, Page 76

New York—Sharp advances in zinc, tin and silver were the outstanding features of the nonferrous metal markets last week. Prime western zinc rose $2 a ton to 4.00c per pound, East St. Louis, Monday and up to 4.10c Friday. Straits spot tin shot up to around 51.00c compared with the previous week's close of 49.50c. Silver attracted wide attention by closely approximating the 1926 peak of 68.62½c.

Copper—Demand was well sustained despite slight recessions in activity in copper and brass product mill buying. Prices held steady in the domestic market at 9.00c, Connecticut, while advancing abroad to around 7.75c, c.i.f. European ports. Sentiment in the trade continues optimistic.

Zinc—Consumer buying was active with most sellers Friday asking 4.10c, East St. Louis, for prime western.

Strong position of the market was supported also by favorable March statistics and curtailment of production.

Lead—Activity in lead increased with consumers showing considerable buying interest. Leading sellers equaled daily ore intakes on fair tonnages. The market tone was steady at 3.50c, East St. Louis, and 3.65c, New York. St. Joseph Lead continued to ask $1 premium on the eastern market.

Tin—Marked scarcity of supplies of Straits tin for delivery through April contributed to a sharp advance in prices to over 51.00c. Sales were fair during the early part of the week but light during the latter half. There was very little actual consumer buying noted.

Antimony—Demand was limited to small lot tonnages but prices held unchanged on the basis of 14.25c, duty paid, for Chinese spot.

Silver—Commercial bar silver advanced sharply to 68.50c per ounce for foreign metal following the boost in the treasury's price for newly mined silver to 71.11c.

Men of Industry

(*Concluded from Page* 34)

April 13 from New York for Naples. His itinerary will take him through Italy, France, Germany and England where he will observe economic and industrial conditions, and their effect on activities of the Armco International Corp. in foreign markets.

♦ ♦ ♦

William M. Hager has been elected a vice president of American Car & Foundry Co., New York. Howard C. Wick, secretary of the company, has been appointed assistant to the president.

♦ ♦ ♦

Charles J. Thomas, for 10 years executive secretary of the Greater Buffalo Advertising club, Buffalo, and prior to that active in sales and engineering work in the telephone field, has been named secretary-manager of the Cleveland Engineering society, Cleveland.

He succeeds Carlton R. Sabin, who has resigned to become manager of the Cleveland office of C. M. Wilkinson Co., handling equipment, engineer and contractor.

♦ ♦ ♦

Joseph W. Royer, works manager of the Medart Co., St. Louis, manufacturer of power transmission machinery, has been elected vice president in full charge of manufacturing. He has been associated with the company since 1915.

♦ ♦ ♦

W. M. Lake, formerly manager of the Follansbee, W. Va., works of Follansbee Bros. Co., Pittsburgh, has been appointed general manager of sales, succeeding C. A. Wilson.

Victor E. Marlier has been named assistant to the general manager of operations, Arthur White. E. E. Bowen has been made superintendent of the Follansbee works, and Harry M. Vogelsong superintendent of the Toronto, O., division.

♦ ♦ ♦

Harold B. Ressler, vice president, Joseph T. Ryerson & Son Inc., Jersey City, N. J., has been elected president of the New York chapter of the American Steel Warehouse association. Other new officers include: Vice presidents, Walter Ganong, Edgar T. Ward's Sons Co., Newark, N. J., and A. J. Bragg, Egleston Bros. & Co. Inc., Long Island City, N. Y.; and secretary-treasurer, Charles Kramer, Scully Steel Products Co., Newark.

♦ ♦ ♦

G. N. Harris and J. G. Green, both formerly associated with Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., and Henry Harris, formerly president of the United Electric Light Co., Wilmerding, Pa., have formed the Harris-Green Co., Farmers Bank building, Pittsburgh, to handle sales of motors, control, transformers, line material, power factor corrective devices and similar equipment.

Mr. Green has been manager of the general industrial and resale sections of the Westinghouse organization. Mr. G. N. Harris has been with the Pittsburgh sales office of that company. Mr. Henry Harris has been retired since 1927.

Transportation

A COMPLICATION in the interstate commerce commission's program granting railroads emergency financial relief by permitting them to increase interstate freight rates approximately 7 per cent, effective April 18, is the attitude of state commissions on intrastate rates.

New York, it is understood, is reluctant to accede to a comparable intrastate increase. A dislocation of the competitive situation will result if this stand is maintained; for example, shipments from Buffalo to many important consuming points within New York state would take present rates, whereas Ohio and Pennsylvania movements, crossing state lines, would be subject to the higher interstate rates. It seems probable, however, that some adjustment will be achieved.

To hasten application of the emergency rates the ICC last week authorized carriers to put them in effect on five days notice, and April 18 has been designated by the carriers as the effective date. On iron and steel the interstate increases will be 7 per cent or a maximum of 2 cents per 100 pounds on finished steel and 40 to 45 cents per ton on semifinished steel and pig iron.

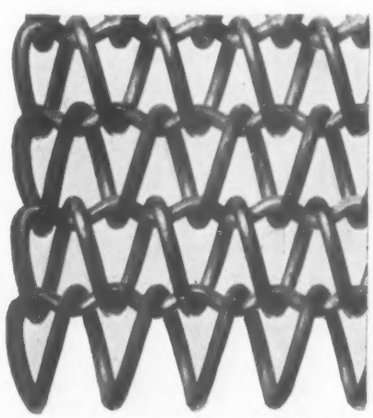
J. & L. BUILDS 500TH BARGE

When the Jones & Laughlin Steel Corp., Pittsburgh, this week launches an Ohio river barge for the Campbell Transportation Co., it will mark the 500th steel barge it has built in the

THIS BELT

runs true—
remains flat—
does not distort
and is completely flexible

Made in all proven metals. Ideal for washing, drying, baking, annealing and other severe process conditioning uses requiring treatment at elevated temperatures.



U. S. Patent No. 1,952,873

WICKWIRE SPENCER STEEL COMPANY
New York City Worcester Buffalo Chicago San Francisco

WISSCO CONVEYOR BELTS

Send for the new Conveyor Hand Book

24 years it has been engaged in this business.

ESCANABA HITS ORE POOL

Escanaba (Michigan) chamber of commerce and the Escanaba & Lake Superior railroad have filed petitions with the ICC in Washington opposing proposal of the Chicago & North Western and Chicago, Milwaukee, St. Paul & Pacific railroads to pool facilities for handling iron ore traffic from the Menominee range to Escanaba, at an estimated annual saving of $80,000.

VOTES $40,919,000 FOR CANAL

For canalization of the Beaver and Mahoning rivers from the Ohio river to Struthers, O., opening up a 9-foot navigable waterway to the Youngstown steel district, an appropriation of $40,419,000 is included in the rivers and harbors bill passed by the house in Washington April 10. It is now before a senate committee.

Last week, A. C. Townsend, president, the Townsend Co., New Brighton, Pa., claimed that this improvement of the Beaver river, which the Townsend plant adjoints, would destroy the mill race and power plant facilities of his company.

THREE BILLIONS FOR STEEL

Of the $10,150,000,000 spent by American railroads in the past decade for materials and supplies, $3,100,000,000 went for products of iron and steel, states the committee on public relations of the eastern railroads. This figure represents only direct purchases, and not iron and steel included in equipment and supplies manufactured under contract.

Financial

BETHLEHEM STEEL CO.'S new continuous sheet-strip mill at Lackawanna (Buffalo) should reduce the cost of these products $6 to $8 per ton from present methods, Eugene G. Grace, president of Bethlehem, told stockholders at their annual meeting April 9.

As happened at the United States Steel Corp. meeting the week previous (STEEL, April 8, p. 9) Bethlehem officials were heckled by several stockholders, the issue being salaries and dividends. A motion to limit 1935 salaries of the chairman, president and secretary to 20 per cent of the net profits of 1934 was defeated by 2,370,220 votes to 335.

Mr. Grace pointed out that Bethlehem has large capacity for heavy products which have been in less demand than light ones and that its capacity in light products, now inadequate, will be greatly augmented by present expansion.

General Electric Co., Schenectady, N. Y., has been awarded the contract for electrical equipment for the new continuous strip-sheet mill of Bethlehem at Lackawanna. The order is worth over $1,250,000.

EMSCO INCREASES PROFIT

Emsco Derrick & Equipment Co., Los Angeles, reports 1934 profit of $102,135, compared with a net of $71,846 is 1933. Compared with 1933, sales were 50 per cent higher, while selling and general expenses increased less than 10 per cent. The following directors have been elected: E. M. Smith (president), Edwin W. Goeser, Chas. D. Wagner, J. S. A. Smith, S. P. Farish, Harry C. Morehouse, and L. A. Rawson.

INTERLAKE PROFIT HIGHER

Interlake Iron Corp., Chicago, reports for 1934 net loss of $683,764, compared with loss of $817,331 in 1933. Current assets of $11,828,367 on Dec. 31, 1934, compared with current liabilities on the same date of $1,844,971.

¶Jones & Laughlin Steel Corp., Pittsburgh, at its annual meeting April 23 will issue an amendment to increase the number of directors from 15 to 17.

¶Independent Pneumatic Tool Co., Chicago, reports 1934 net of $672,280, compared with a net of $190,459 in 1933.

Meetings

PURCHASING Agents' Association of Pittsburgh will hold its annual election of officers at its April 16 meeting at the William Penn hotel, Pittsburgh.

Albion Bindley, purchasing agent, Pittsburgh Steel Co., Pittsburgh, has been selected by the nominating committee for president. Thomas D. Jolly, director of purchases, Aluminum Co. of America, Pittsburgh, has been nominated for vice president; A. D. Feeman, purchasing agent, Superior Steel Corp., Carnegie, Pa., for secretary, and E. C. Buerkle, purchasing agent, National Bearing Metals Co., Pittsburgh, for treasurer. I. E. Walton, purchasing agent, Heppenstall Co., Pittsburgh, has been nominated for national director.

BAR GROUP TO HOT SPRINGS

Eleventh annual meeting of members of the Concrete Reinforcing Steel institute, 201 North Wells street, Chicago, and of the Reinforcing Materials Fabricating Industry code will be held at the Homestead hotel, Hot Springs, Va., April 29-May 1.

ZINC MEET APRIL 22-23

American Zinc institute, 60 East Forty-second street, New York, has scheduled its annual meeting for the Hotel Statler, St. Louis, April 22-23. The Monday meeting will be devoted to the industry's problems, including NRA; the Tuesday meeting to the galvanizing program.

CALL HARBOR MEET

National Rivers and Harbors congress will hold its thirtieth annual convention at the Mayflower hotel, Washington, May 2-3. Unusual interest is expected because of the possibility that river and harbor work will participate heavily in the proposed five billion dollar federal relief program.

KIDD

DRILL ROD
COLD DRAWN SHAPES

Give us the opportunity to demonstrate that accurate drawing, smooth defect-free finish, expert heat treatment and careful inspection are "built in" to any and every Kidd drawn product, standard or special.

37 Years of Experience!

Ask for the decimal equivalent chart.

KIDD DRAWN STEEL CO.
Aliquippa, Pa.
(Pittsburgh District) *Phone: Aliquippa 196*

Activities of Steel Users and Makers

TOLEDO, LORAIN & FAIRPORT DOCK CO., 1208 Hanna building, Cleveland, subsidiary of Oglebay, Norton & Co., Cleveland, has leased from the Baltimore & Ohio railroad its ore and coal docks at Lorain and Toledo, O., and will operate them from April 16.

The ore dock at Toledo has storage capacity of 500,000 tons and is equipped with two Hulett unloaders with 15-ton buckets, the rated unloading capacity being 1000 tons per hour. The Toledo coal dock has a Wellman-Seaver-Morgan car dumper with capacity of 1500 tons per hour.

The Lorain ore dock has three Brown electric unloaders with 15-ton buckets and capacity of 1000 tons per hour. Its storage capacity is 350,000 tons. The Lorain coal dock has a McMyler car dumper with rated capacity of 2000 tons per hour. This dock also has a special rig equipped with hopper, permitting self-unloading vessels to unload direct into cars.

Oglebay, Norton & Co. has been in the Lake Superior ore trade for 50 years. It manages the Columbia Transportation Co., with a fleet of 17 bulk freighters, and recently took over management of four self-unloading bulk vessels of the Valley Camp Coal Co.

♦ ♦ ♦

Rust Engineering Co. and Rust Furnace Co., Pittsburgh, are now located on the tenth floor of the Clark building, having recently moved there from the Koppers building.

♦ ♦ ♦

Diamond Chain & Mfg. Co., Indianapolis, has appointed Hagerty Bros., 923 South Washington street, Peoria, Ill., distributor for its roller chain, sprockets and flexible couplings.

♦ ♦ ♦

Gilmore Steel & Supply Co., 825 Folsom street, San Francisco, has been appointed warehouse distributor of Enduro stainless steel by Republic Steel Corp., Youngstown, O. This appointment brings the number of warehouse stocks of this steel to 45.

♦ ♦ ♦

Riehle Bros. Testing Machine Co., Philadelphia, manufacturer of testing machines, has become part of American Machine & Metals Inc., 100 Sixth avenue, New York. Abbott F. Riehle will continue as general manager, his executive offices being at this address. Engineering staff and key men have been transferred from Philadelphia to the plant of American Machine & Metals Inc. at East Moline, Ill., where ample facilities are available. The American company now includes Halliwell Inc., Oil Products Appliance Co. Inc., Tolhurst Machine Works Inc., Trout Mining Co., Debothezat Corp. and Troy Laundry Machinery Corp.

♦ ♦ ♦

G. & G. Mfg. Co., Cincinnati manufacturer of stamping dies, has moved its plant from 2116 Colerain avenue to 2500 Spring Grove avenue.

♦ ♦ ♦

Lynch Corp., Anderson, Ind., manufacturer of glassmaking machinery, has orders on books to insure operations for several months. A night shift is being employed.

♦ ♦ ♦

Cleveland Crane and Cleveland Tramrail divisions of the Cleveland Crane & Engineering Co., Wickliffe, O., have moved their New York offices from 50 Church street to 60 East Forty-second street.

♦ ♦ ♦

Horace T. Potts Co., Philadelphia, has been appointed distributor of seamless stainless steel pipe in the Philadelphia district by Babcock & Wilcox Tube Co., New York, in addition to the latter's seamless boiler tubes.

♦ ♦ ♦

Harnischfeger Corp., Milwaukee, recently designed and built a crane for Inland Steel Co., Chicago, in 16 working days, to meet needs of the latter to handle a large tonnage order. The Harnischfeger company believes this is a record for speed for such an accomplishment. The crane is of 15-ton capacity, with three motors, spanning 100 feet, all-steel construction with cast steel trolley frames. It is provided with mill-type motors with full magnetic relay controls, composite type end trucks and platforms both sides of the bridge.

♦ ♦ ♦

Republic Steel Corp., Youngstown, O., will move its New York district sales office May 1 to the Chrysler building, with W. H. Oliver continuing in charge. The company's export department will have offices at the same location, in charge of D. H. Bellamore, general export manager.

♦ ♦ ♦

Appleton Electric Co., 1701 Wellington avenue, Chicago, has moved its office at New York from 150 Varick street to the Port Authority Commerce building, 76 Ninth avenue, where larger space is available to carry heavier stocks.

♦ ♦ ♦

Link-Belt Co., Chicago, has moved its warehouse at Portland, Oreg., from Front avenue, where it has been for 20 years, to Fourteenth avenue and Savier street. D. L. Shirley is resident manager. The new location contains 10,000 square feet of floor space and complete shipping facilities. The sales office will be at the same address, 1637 N. W. Fourteenth avenue.

♦ ♦ ♦

Consumers Steel Products Corp., 6450 East McNichols road, Detroit, has completed construction of a new pickling plant, to be devoted to pickling of sheets, bars and other steel products, with daily capacity of 500,000 pounds. The pickling plant is in addition to the company's new warehouse, also modern in every respect. It is fitted with overhead traveling cranes throughout. Other principal equipment includes roller

18 Cr. 8 Ni. C. under .07

Stainless and Heat Resisting

ARC WELDING

ELECTRODES

MAURATH · ELECTRODES · IN WORLD WIDE USE

Also all other useful analyses of chrome and chrome-nickel electrodes carried in stock. Send for sample of your analysis.

MAURATH, INC.

7300 Union Ave., Cleveland, Ohio

leveler, stretcher leveler and six shears with capacity up to ⅝-inch thick and 156 inches long. Stock consists of approximately 5000 tons of steel, including all gages and sizes of cold-rolled sheets, hot-rolled sheets, galvanized sheets, terne plate, paint grip sheets and galvanized corrugated roofing sheets.

Big Steel Users' Needs Off 67,000,000 Tons in 5 Years

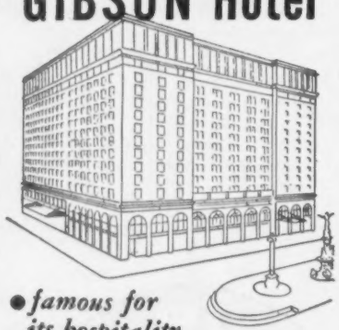
From 1930 to 1934 major consumers of steel used about 67,000,000 tons less than in the five years 1925 through 1929, according to the American Iron and Steel institute. This tonnage represents 17 months' operations at present capacity.

These major industries—construction, railroad, automotive, oil, gas, mining, agricultural and machinery—since 1930 have consumed 59,000,000 tons, whereas in the preceding five years they took 126,000,000 tons.

FAMOUS LANDMARKS

Washington has the CAPITOL

Cincinnati has the GIBSON Hotel



● *famous for its hospitality*

More than a hotel . . . a place to *live*

All that the most modern touch can add to age-old hospitality. Here the guest is king—The Gibson is his kingdom.

RATES

from $2.50 single; $4 double

F. W. PALLANT, General Manager

●

Equipment

Cleveland—Award of six cranes, ranging in capacity from 200 tons downward, for the new plant of Electro-Motive Corp., Chicago, General Motors subsidiary, has been confirmed by Cleveland Crane & Engineering Co. here. A number of details in the contract have yet to be worked out. The Chicago company will be allied closely with Winton Engine Co. here in building diesel-powered railcars and locomotives. Plans for the machine tool exposition here in the fall indicate that it will be probably the largest display of industrial equipment ever staged, and will serve to concentrate buyers' attention on the money-saving features of modern machines.

Pittsburgh—Rust Furnace Co. here has announced receipt of the following orders booked during the past month: From Youngstown Sheet & Tube Co., Youngstown, O., eight chambers of box annealing units for the company's new continuous mill; from Bethlehem Steel Co. for its Lackawanna, N. Y., works, three slab heating furnaces of 50 tons an hour capacity each, and a 150 x 96-foot normalizing furnace. Rust company has also received orders from the United Engineering & Foundry Co. for complete engineering and drawings for slab heating furnaces for the Zaporjstal Steel Works, Zaporjstal, Russia, in connection with United's construction of a continuous mill for this Soviet producer.

New York—Slight improvement in inquiry for sheet metal working equipment and standard tools for export marks the machine tool trend. In addition navy requirements for Philadelphia are slightly heavier, including a 10-ton electric bridge crane and four 2-ton monorail hoists for the aircraft factory there on which bids are in. Quotations are also in on a 10-ton electric bridge crane, 85 feet 11½-inch span, for the navy yard at Brooklyn, N. Y.

Chicago—A slight betterment is noted in machinery and equipment market activity. Orders are small but more numerous, while inquiries indicate better interest on the part of manufacturers in equipment rehabilitation. Orders for repair parts also are heavier. Railroads are more active in purchasing repair parts than in buying new machinery, and little improvement in new equipment business from railroad shops is anticipated this year. Most of the machine tools on the list for the Rock Island, Ill., arsenal have been placed. While little new business is appearing from farm implement plants, this group as well as several others are fairly active buyers of small tools.

Boston—Demand for machinery and plant equipment is unchanged for general industrial requirements. Inquiry for government needs, however, is slightly heavier. For an arsenal at Springfield, Mass., a fair volume of machine parts have been bid while four electric pot-type furnaces for the same shop will be closed April 22. For a submarine base at New London, Conn., five heavy machines are being bid, including a horizontal boring, milling and drilling machine, hydraulic bender, vertical cylinder boring mill, bending roll and keyseating machine; bids close April 19. For Boston, bids close April 23 on a steel forming press brake.

Construction and Enterprise

New York

NEW YORK—A three-story factory building at 625-629 West 130th street has been purchased by L. Kantor & Co., interior woodworking company, which occupies an adjoining building.

NEW YORK—Articulating Valve Corp. has been organized to operate a machine shop, by H. C. Kupper, J. J. Dewey and G. W. Douglass. Papers were filed by C. M. Gilpin, 512 Fifth avenue, New York.

NEW YORK — Ehrenberg Brass Mfg. Co., manufacturer of plumbing supplies, 135 Mulberry street, Manhattan, will move its plant to an industrial building to be erected at 43-23 Thirty-fifth street, Long Island City. Construction contracts have been let.

NEW YORK — Jacob Ruppert Brewery, 1639 Third avenue, has purchased the property of the George Ehret Brewery in Yorkville, between Ninety-second and Ninety-fourth streets, Second and Third avenues. The Ehret plant has not been in operation since 1930 and it is the intention of the new purchaser to rehabiliate the property for early use. The transaction involved $1,500,000.

NEW YORK—Regarding recent reports that Union Bag & Paper Co., Alexander Alder president, Woolworth building planned erection of a mill at

Savannah, Ga., the management states that while it has been working on plans for several months for a new pulp and paper mill and bag factory in the South, the necessary arrangements for constructing and financing the new plant have not been completed, but it hopes to announce a definite program within a month or two. (Noted April 8)

Pennsylvania

BOYERTOWN, PA.—Colebrookdale Iron Co. has plans completed for erection of a 2-story brick and steel structure, 35 x 65 feet. The building will house machinery on the first floor, while the second floor will be used for storage purposes.

BRADFORD, PA.—Northeastern Container Corp. has purchased the plant of the Hanley Machine Co., of Buffalo, in this city. Plans are in progress for expenditure of approximately $70,000 for rehabilitation and installation of new machinery and equipment for manufacture of corrugated containers.

LOGANS FERRY, PA.—Plant of the Aluminum Co. of America, Pittsburgh, here was damaged by explosion and fire April 6.

PITTSBURGH — Pittsburgh Tool, Knife & Mfg. Co., 7501 Thomas boulevard, recently enlarged its manufacturing quarters about 25 per cent.

PITTSBURGH—Steel & Engineering Inc., 7501 Thomas boulevard, has recently been organized to deal in the warehousing of steel products and the manufacture of stampings and of patented steel mill devices. W. S. Orr is president and secretary.

PITTSBURGH—American Oil Co., T. J. O'Connell, company architect, American building, Baltimore, will take bids about April 25, for erection of a bulk plant at Hays station here.

PITTSBURGH — Pittsburgh Corrugated Box Co. has leased a building at 7515 Thomas boulevard, formerly occupied by the Pennsylvania Pump Co. Work is under way on an addition, adding approximately 40,000 square feet of space.

PITTSBURGH — Sommerville Co., 5641 Butler street, maker of ornamental iron and light structural steelwork, offers at public sale April 29, sale of its real estate and buildings through receivers Carl Cappel Jr. and William Pearson.

PHILADELPHIA — Manion Steel Barrel Co., Oil City, Pa., plans to remove its barrel plant here within the next three months, retaining only the paint and varnish divisions at Oil City.

WASHINGTON, PA.—Machines and equipment of the Sidway-Topliff Co., maker of toys, will be sold at public auction April 16, by order of the Union Trust Co., Pittsburgh, trustees. Industrial Plants Corp. will conduct the sale.

Massachusetts

HAVERHILL, MASS. — Equipment and machinery of several shoe manufacturers here were damaged by fire, which is reported to have started in the Lennox & Briggs Co. plant.

Ohio

CINCINNATI—Machine shop of the Crosley Radio Corp. sustained damages by explosion and fire April 11.

DAYTON, O.—Air corps, materiel division, contracting officer, Wright field, will take bids April 25, circular 35-655, on rotary pumps and motors.

TOLEDO, O.—Libbey, Owens, Ford Glass Co. has announced a $1,700,000 improvement program at its Toledo, O., Charleston, W. Va., Ottawa, Ill., and Shreveport, La., plate glass plants, increasing safety glass capacity and warehouse space.

Michigan

ADRIAN, MICH.—Bixby hospital is having plans prepared for repairs and improvements to its heating plant.

BATTLE CREEK, Mich.—H. G. Christman - Lansing Co., Lansing, Mich., has been awarded contract for the construction of a sewage disposal plant here. Estimated cost $500,000. H. P. Jones Co., Toledo, O., engineer.

BAY CITY, MICH.—The newly-formed Valley Steel Castings Co., headed by Samuel S. Fair, is planning to renew operations, after installation of electric furnaces, at the former plant of the Ohio Steel Foundry Co., which has been idle for three years.

BENTON HARBOR, MICH.—Benton Harbor Malleable Industries is launching an expansion program to increase production. The building housing the die-casting division is being enlarged and several thousand dollars worth of machinery has been bought and will be installed when the building is completed. J. N. Klock is president.

DETROIT — Universal Radiator Corp. has been incorporated to do specialty manufacturing, by C. A. Strobel, 224 Ohio building, Akron, O.

DETROIT—Westlof Tool & Die Co., 428 Bellevue avenue, has been incorporated to manufacture tools and dies, by Robert J. Westrick, 3847 Fairview avenue.

DETROIT—Modern Stamping & Mfg. Co., 227 Iron street, has been formed with $25,000 capital to deal in sheet metal stampings, by John C. Aldridge, 6164 Yorkshire road.

DETROIT—Fassler Welding Machine Co., 424 Stormfeltz-Loveley building, has been incorporated to build and sell welding machines, by Peter W. Fassler, 2911 Burlingame avenue.

DETROIT — Brown-McLaren Mfg. Co., 5853 West Fort street, has awarded contract to Walridge-Aldinger Co., 409 Griswold street, for erection of a 2-story, 50 x 75 foot, addition to its plant.

DETROIT—Contracts have been let and work started on a $250,000 addition to the Dodge Bros. truck plant. The addition will be 1-story, 96 x 576 feet, affording 55,296 square feet of floor space.

DOWAGIAC, MICH.—Premier Furnace Co., 304 East Railroad street, has been incorporated with $72,800 capital to deal in furnaces, by Richard M. Judd, 403 Main street.

ELBERTA, MICH.—Village clerk is taking bids April 16 for the construction of a water system, estimated to cost $35,000.

FRANKENMUTH, MICH.—Weber Construction Co., Bay City., has begun work on construction of additions to the brewery here. A 2-story building, 40 x 125 feet, to be used as a bottling plant and for storage, is among the improvements which will double capacity.

FREMONT, MICH.—Village is taking figures for an addition and alterations to its sewage plant, costing about $30,000.

GRAND RAPIDS, MICH.—Valley City Brewing Co. has completed preliminary plans for a 2-story addition and alterations to a plant on Leonard street. Estimated cost is $50,000.

JACKSON, MICH.—Hinckley-Myers Co., maker of garage equipment, has started construction of an addition to its plant.

KALAMAZOO, MICH. — Work is nearing completion on an addition to

WANTED

● Position by young man 30 years of age, single with good cultural and educational background and now employed as salesman with Steel jobber serving the Kansas City trade territory.

● Six years experience selling steel and desire connection with plate or sheet mill sales organization.

● College man, but don't let it bother me. One year's experience as student salesman, working in steel mill open hearth, plate and hot mill departments and have good working knowledge of chemistry of steel making.

● Salary no object, but the organization that I connect with must have high calibre personnel, reasonably free from petty internal politics. Consider myself a good salesman and diplomat and feel that I will be an asset to any high class organization.

● If you can qualify and have such an opening, at your convenience and my expense, I will meet with you for an interview.

● This advertisement not intended to convey this writer's conceit. The necessity of outlining my qualifications in this manner, is the father of the style.

Address Box 224
STEEL
Cleveland, Ohio

the plant of the Sutherland Paper Co. The building, to be used as a warehouse, is 111 x 226 feet, with a loading dock 38 x 110 feet. A portion of the second floor will be used for manufacture of specialties.

LANSING, MICH. — Olds Motor Works division of General Motors Corp. has purchased the former Durant plant here with 900,000 square feet of floor space and will move to it the Fisher Body Corp. bodymaking activities now conducted in a building adjacent to the present Oldsmobile plant. Some new equipment will be required by Fisher, for whom H. E. Beyster, Fisher Body Corp., 9-267 General Motors building, Detroit, is works engineer. Space now occupied by Fisher, but to be vacated, will be utilized by Oldsmobile for extending its production facilities. C. L. McCuen is president of the Olds Motor Works.

MUSKEGON, MICH. — Enterprise Brass Works Corp., successor to the Enterprise Brass Works, has purchased the former Accuralite building and is preparing to resume operations soon. Installation of machinery has been started under direction of Frank Holt, head of the corporation. (Noted March 18)

Illinois

CHICAGO — Armour Institute of Technology 3300 South Federal street, is preparing plans for construction of a 17-story building on a new site at Lake Shore drive and Erie street where the institute will move, probably this fall.

PEORIA, ILL. — Hiram-Walker, Gooderham & Worts have had plans drawn for a new warehouse building to cost approximately $150,000. It will be of reinforced concrete, brick and steel construction.

PEORIA, ILL.—Illinois Corrugated Culvert Co. has been organized to fabricate and sell Toncan iron corrugated metal pipe, sectional plate pipe and arches. A modern culvert manufacturing plant is under construction here, but pending its completion shipments are being made from Danville, Ill., where the new company is operating the plant formerly owned by the Canton Culvert Co.

Indiana

MUNCIE, IND. — Brammer Tool Service Inc., High and Seymour streets, has been formed to manufacture, sell and service tools, machinery and equipment of all kinds. Incorporators are George B. Brammer, 25 Orchard place, Muncie, also resident agent, Ora M. Love and Otis Edgington.

SULLIVAN, IND. — Dr. C. E. Fisher and H. I Smith, who own and operate the Sullivan Foundry, are planning to enlarge the local foundry and install new equipment to make possible the manufacture of stoves.

Kentucky

MADISONVILLE, KY.—Kentucky public service commission has granted permission to city to erect a filtration plant costing $35,000.

Maryland

BALTIMORE—Maryland Retinning Co., Henry L. Heuther, 237 President street, is planning to erect a 1-story addition, 25 x 97 feet.

BALTIMORE — Engineering Contracting Corp., 504½ St. Paul street, has contract, and work has started on erection of wire factory at 1001 Edison highway for the Rustless Iron Corp.

EDGEWOOD ARSENAL, MD. — Edgewood arsenal will receive bids April 19, E.A.P. 35-123, for a motor generator set.

HAGERSTOWN, MD. — Kreider Reisner Aircraft Corp. is erecting an addition to its plant.

HAGERSTOWN, MD. — Danzer Metal Works Co. has been incorporated by Roy Danzer and Joseph D. Mish to operate a metalworking plant.

District of Columbia

WASHINGTON—United States coast guard will take bids April 24, proposal AV-3165, for tools for engines; April 25, proposal AV-3166, for tools for engines.

WASHINGTON—Bureau of supplies and accounts, navy department, will open bids April 26, schedule 4799, one turbine-driven centrifugal pump, delivered at Norfolk, Va.; April 23, schedule 4769, 13 motor-driven sensitive drilling machines, delivered at Newport, R. I.; April 19, schedule 4772, turbine-driven boiler feed pumps, delivered at Annapolis, Md.

WASHINGTON—Bureau of supplies and accounts, navy department, will open bids April 19, schedule 4789, one motor-driven hydraulic bender; schedule 4740, one motor-driven drilling and milling, horizontal boring machine; schedule 4748, one motor-driven vertical cylinder boring and bushing, boring and turning machine, all for delivery at Submarine base, Conn.

WASHINGTON—Bureau of supplies and accounts, navy department, will open bids April 19, schedule 4743, one motor-driven radial drill machine; schedule 4746, one motor-driven universal gear testing machine; schedule 4754, one motor-driven rotary grinding machine; April 23, schedule 4771, one motor-driven cylindrical plain grinder machine, all for delivery at Philadelphia.

North Carolina

CHARLOTTE, N. C.—Shaw Mfg. Co. has been incorporated with $50,000 capital by H. P. Shaw, 900 Queens road, and J. D. Shaw, to manufacture furniture.

GREENSBORO, N. C.—Jones Bros. Bakery Inc., O. C. Jones president, 104 East Lee street, has been granted permit to erect an addition to its plant costing $9350. The company will expend $15,000 for equipment, including an air conditioning system, a counter flow bread cooling system, etc.

SILER CITY, N. C. — Staley Roller Mill, owned by the Julian Milling Co., Julian, N. C., recently sustained damages by fire.

Tennessee

ETOWAH, TENN.—Board of commissioners will soon call for bids for installing sewer system; loan and grant of $115,000 is available.

KNOXVILLE, TENN.—Scott Mfg. Co., recently incorporated to manufacture plastic products such as bottle closures, etc., will install new machinery. Alex Scott is president and manager.

MEMPHIS, TENN.—United States engineer office, P. O. box 97, will take bids April 17, circular 312, for a 32-inch dredging pump for the dredge Henry Flad.

NASHVILLE, TENN.—Smith Packing Co., 530 Third avenue, North, is tearing down its present building and erecting a new plant. Modern equipment will be installed.

West Virginia

HUNTINGTON, W. VA. — City, Mayor Martin V. Chapman, is considering purchasing a site on Second avenue at Fifth street for erection of an incinerator, costing about $50,000.

Virginia

EMPORIA, VA.—Main plant of the Greensville Mfg. Co. lumber mill recently was damaged by fire. H. W. Hall is president.

HARRISONBURG, VA. — National Fruits Product Co., Woodward building, Washington, will expend $100,000 in converting the Shenandoah Valley Canning Corp.'s plant into a pickle factory.

STRASBURG, VA.—City has applied to PWA for loan and grant of $54,495 for improvements to waterworks system.

Missouri

CRYSTAL CITY, MO.—Pittsburgh Plate Glass Co., Grant building, Pittsburgh announced additional plant expansion and improvements, involving an expenditure of $1,905,000, a major part of which will be for equipment to make safety glass at the company's division here.

KANSAS CITY, MO.—Liquid Carbonic Corp., Thirty-first and Kedzie avenue, Chicago, is investing approximately $250,000 in a new unit here to produce dry ice. The new building will house a 1-story power plant.

KANSAS CITY, MO. — Kansas City Southern Railway, C. E. Johnston president, is planning to build a $250,000 headhouse, equipping it with modern machinery, to replace the structure damaged by fire.

Arkansas

HOPE, ARK.—J. L. Williams & Sons Lumber Co. is planning to rebuild its burned sawmill unit.

Oklahoma

BLACKWELL, OKLA.—Chamber of commerce, E. H. Martin secretary, is negotiating with the Delco Co., Dayton, O., for a light distributing plant for Kay, Noble, Osage and Pawnee counties.

CUSHING, OKLA.—Bids for construction of power plant were not received March 26 as scheduled, and new date for receiving bids has not been set as yet. W. R. Holway, Tulsa, Okla., engineer.

Texas

BELTON, TEX.—City has tentative plans for constructing a power plant.

BURNET, TEX. — City, W. C. Galloway mayor, has revised plans by J. W. Beretta Engineers Inc., National Bank of Commerce building, San Antonio, Tex., for waterworks, including mains, meters, pump house, water well and elevated tank. PWA

(*Please turn to Page* 100)

SIMONDS
TREATED GEARS

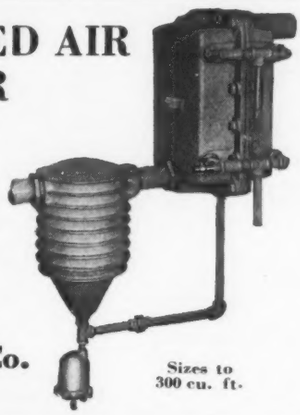
Also—
- Ramsey Silent Chain Drives
- Gates Vulco Rope Drives
- All Steel Silent Pinions
- Bakelite Silent Pinions

TREATED gears for all kinds of service cut and finished to specifications.

Ample equipment for light and heavy gears . . . Prompt delivery.

The SIMONDS Mfg. Co.
25th St. - PITTSBURGH, PA.

COMPRESSED AIR DRYER



Thoroughly extracts water and oil from compressed air by a simple scientific method. Eliminates operating troubles in all pneumatic equipment. Installed by many leading industrial plants.

Cost nothing to operate—No moving parts to wear out—Automatic in service.

Sizes to 300 cu. ft.

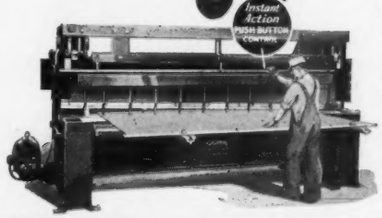
Ruemelin Mfg. Co.
1572 First St.
Milwaukee, Wis.

MEDART
Bar and Tube MACHINERY
For turning, straightening and polishing round bars and tubes.

Complete data on request

THE MEDART COMPANY
3500 DE KALB ST. ST. LOUIS, MISSOURI

Beatty TYPE 45 SHEAR



This new shear for light gauge metals possesses all the requirements mostly desired for accurate, speedy and low cost work. Its construction and operation is radically different from all other shears. Write for full information.

Also builders of

SHEARS, PUNCHES, SPACING TABLES, COPING MACHINES, BULLDOZERS, DIES

BEATTY MACHINE & MANUFACTURING COMPANY
944 - 150th Street, Hammond, Indiana

Busy Executives Agree on The COMMODORE

New York's finest combination of convenience, time-saving efficiency, comfort and economy

In the heart of the city's greatest business zone. Express subway from lower lobby to all other districts

2000 quiet, restful, outside rooms —all with bath—from $3

RIGHT AT GRAND CENTRAL
NEW YORK CITY
FRANK J. CROHAN, *President*

(*Concluded from Page 98*)

loan and grant of $46,000 has been approved.

DALLAS, TEX.—Continental Fence & Wire Co. has been organized by J. M. Moore and K. E. Mason.

HOUSTON, TEX.—Dowdell, Lockwood & Andrews has been incorporated by J. R. Dowdell, 8201 Grafton street, and M. G. Lockwood, to engage in the manufacture of iron and steel.

HOUSTON, TEX. — International Harvester Co., Commerce avenue and Hamilton streets, plans erecting an assembling plant for agricultural machinery at Navigation boulevard. Cost is estimated at $100,000.

KERRVILLE, TEX.—City will expend approximately $8000 for improvements to gas plant, erecting a building, 22 x 44 feet, and installing new equipment.

LIBERTY, TEX.—PWA has approved loan of $95,000 for power plant. J. H. Garrett, Garrett Engineering Co., 300 Hughes street, Houston, Tex., engineer.

SAN ANGELO, TEX.—City is contemplating erection of power plant and distribution system, costing about $900,000.

Wisconsin

BELOIT, WIS.—Fairbanks, Morse & Co., 900 South Wabash avenue, Chicago, has started work on a new factory building, 62 x 120 feet, in its main works group of shops on Lawton avenue here.

MANITOWOC, WIS.—J. J. Stangel Hardware Co. is building a $50,000 addition to house its automobile parts and supply wholesaling department.

MILWAUKEE—Tool-Craft Design Service Inc. has been organized to provide tool designing service, by W. C. Hammond, F. J. Haas and Paul W. Kutschera, 3448 South Ninth place.

MILWAUKEE — Factory of the Picard Plant Protector Co., 4602 West Mitchell street, recently sustained damages by fire causing loss to considerable machinery and supplies.

MILWAUKEE—Scherff Machine Co. has been incorporated to succeed the partnership business manufacturing special machinery at 2738 South Twenty-ninth street, by Henry H., Walter A., and Donald W. Scherff.

PRINCETON, WIS.—A. H. Rimpler city clerk, will close bids April 18 for construction and equipment of new waterworks and sewerage plants estimated to cost $60,000. A. E. McMahon, Menasha, Wis., consulting engineer.

RACINE, WIS.—Racine Iron & Wire Works, 901 Prospect street, is buying some additional equipment for a 1-story factory addition, 47 x 117 feet, now under construction.

RACINE, WIS.—Bids close April 22 for construction of a filter addition, filter equipment, pumps and mining devices for the city water commission. W. A. Pierce is secretary.

WAUSAU, WIS.—Marathon Battery Co. is letting contracts through Architects Oppenhamer & Obel for erection of a 1-story plant addition, 100 x 110 feet, at 840 Henrietta street.

WAUSAU, WIS. — Mathie-Ruder Brewing Co. is making extensive improvements in its plant, installing a new electric ice machine, filtration system, etc. Contract for nine steel storage tanks has been let to Wausau Iron Works.

Minnesota

ALEXANDRIA, MINN. — H. S. Campbell, city clerk, will receive bids until April 22 for deep well pumping equipment, starter and control, and pump house at the municipal water plant. Burlingame & Hitchcock, Sexton building, Minneapolis, engineers.

DULUTH — Fitger Brewing Co., V. H. Anneke president, is installing considerable new brewery machinery and equipment, including a 65-ton ice machine, freight elevators and a 65-kilowatt synchronous motor generator.

DULUTH—Coolerator Co., manufacturer of air-conditioned refrigerators, has taken over the plant of the former Western Steel Products Co. in New Duluth, Minn., to take care of increased production.

MINNEAPOLIS—Equipment Engineering Co. has been incorporated with capital stock of $50,000 to manufacture speed devices and other equipment, by Addington W. Gerger, Dale F. McFarland and Victor A. Nordley.

MINNEAPOLIS — Rodgers Bros. Co., 8821 West Lake street, has been organized to manufacture hydraulic portable presses for changing track bushings and pins on tractors. The press is supplied with attachments for removing sprockets, gears, pinions, shafts, pulleys, etc.

RED WING, MINN.—Mount La Grange Metals Inc. has been incorporated by F. E. Anderson, William F. Walter and A. R. Hempftling, to deal in the processing and fabrication of metals and metal alloys, and manufacture of dental products. The company will be located in the Goodhue County National Bank building.

ST. PAUL — St. Paul Hydraulic Hoist Co., 292 Walnut street, manufacturer of hydraulic hoists and bodies, will immediately start rebuilding its plant damaged by fire April 6. The drill press and assembly lines, as well as the screw-making departments were severely damaged. R. S. Jenkins is general manager.

North Dakota

NOONAN, N. DAK. — Baukol-Noonan Lignite Coal Co. plans construction of an electric power plant for furnishing power to coal mine.

South Dakota

INTERIOR, S. DAK.—G. H. Dunham, town clerk, will receive bids until April 22 for construction of a municipal waterworks system, including pumping plant and 1½ miles of 4-inch water mains. Dakota Engineering Co., Mitchell, S. Dak., engineer.

Iowa

MARSHALLTOWN, IOWA — Roberts & Oake, West Forty-fifth street and Racine avenue, Chicago, plan construction of a 3-story packing plant addition here to cost about $75,000. It is also planned to construct a processing plant.

Pacific Coast

BAKERSFIELD, CALIF.—Anglo-American Mining Corp. started work April 1 on a $175,000 cyanide plant at its Yellow Aster gold mine in the Randsburg district near here. W. W. Klipstein is executive vice president.

LONG BEACH, CALIF. — Long Beach board of education has approved plans for construction of a shop building to be erected at the Polytechnic high school. Hugh R. Davies, 430 East Ocean avenue, architect.

LOS ANGELES—Fred Forest, 3619 South Vermont avenue, will start work shortly on the erection of a shop building. R. D. King, 1117 Van Nuys building, architect.

MOUNTAIN VIEW, CALIF.—Allan Cutler Inc., 2065 Cowper street, is planning to construct a cannery plant, 300 x 500 feet, with a capacity of 500,000 cases per day. Estimated cost $300,000.

SOUTH GATE, CALIF. — Earl Trudeau, 701 Cogswell road, El Monte, Calif., is preparing preliminary plans for a new factory to be built here for the Purex Co. Plant will include office building, warehouse and manufacturing building, and will cost about $50,000.

STOCKTON, CALIF.—Aron Hershel, formerly president and general manager of the Hershel-California Fruit Products Co., San Jose, Calif., has awarded contract for structural steel for a new $150,000 cannery here to the Golden Gate Iron Works.

STOCKTON, CALIF.—Contract for a warehouse addition to the grain terminal of the Port of Stockton was awarded to Trewitt-Shields Co., Fresno, Calif., not including grading, sprinkler system and equipment, which is to be let under separate contract.

ASTORIA, OREG.—Pillsbury-Astoria Flour Mills Co. will occupy a 6-story, 30 x 66 foot, concrete clearing house being erected for the Port of Astoria by N. H. Leighton Co., 716 South Seventh street, Minneapolis, contractor. Building will cost $35,000 and equipment $20,000.

PORTLAND, OREG. — George H. Buckler, Lewis building, has the general contract for major additions and improvements to the plant of the St. Helens Pulp & Paper Co. Additional equipment will be installed, including a sprinkler system.

BREWSTER, WASH.—City officials have returned unopened, bids for a 50,000-gallon concrete reservoir addition, pump house, etc., due to difficulty of floating bonds. When funds are available new tenders will be called.

SALEM, WASH.—Columbia Distilleries Inc., 404 Pittock block, plans construction of a distillery to cost $60,000. J. E. Wood is manager.

SEATTLE—Acme Boiler & Tank Co., 1122 Elliott avenue, Northwest, has been incorporated by Robert W. Burwell and associates.

SPOKANE—Columbia Basin association announces the following materials yet to be purchased for the Coulee dam project: 12,500 tons of reinforcing, 500 tons of penstock and draft tube bulkhead gates, 2121 tons of trash rack metal, 800 tons of structurals for power house, 600 tons of metal tubing, pipes, fittings and valves, 115,000 feet of metal sealing strips, 3116 tons of gates and conduit linings, 23 tons controls for gates, two 375-ton, one 20-ton, two 150-ton gantry cranes, 110 tons track rails and 144,000 feet of electric metal conduit.

WENATCHEE, WASH. — H. M. Briegenzer, local contractor, is constructing a $25,000 concrete incinerator for a local garbage disposal company.